

636587

REPORT NUMBER 301L-GTL-03-004

SAFETY COMPLIANCE TESTING FOR FMVSS NO. 301L FUEL SYSTEM INTEGRITY

HYUNDAI MOTOR CO.
2003 HYUNDAI SANTA FE
NHTSA NO. C30508

GENERAL TESTING LABORATORIES, INC.
1623 LEEDSTOWN ROAD
COLONIAL BEACH, VIRGINIA 22443



JUNE 26, 2003

FINAL REPORT

PREPARED FOR

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6111 (NVS-220)
WASHINGTON, D.C. 20590

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Approval Date: 6/26/03

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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2003 Hyundai Santa Fe MPV was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 301 testing to determine if the vehicle was in compliance with the requirements of the standard. The purpose of this standard is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes, and resulting from ingestion of fuels during siphoning.

1.1 The test vehicle was a 2003 Hyundai Santa Fe MPV. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: KM8SB12B83U411971

B. NHTSA No.: C30508

C. Manufacturer: HYUNDAI MOTOR CO.

D. Manufacture Date: 11/02

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 301 testing on May 28, 2003.

SECTION 2

COMPLIANCE TEST RESULTS SUMMARY

2.0 TEST RESULTS

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure, TP-301-02 dated 8 November 1994 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-301-02, "Fuel System Integrity".

Based on the test performed, the 2003 Hyundai Santa Fe MPV appears to meet the lateral impact requirements of FMVSS 301 testing.

SECTION 3

COMPLIANCE TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of testing on the 2003 Hyundai Santa Fe MPV.

SUMMARY OF RESULTS

Vehicle's NHTSA No.: C30508 Test Model: SANTA FETest Date.: 05/28/03 Time: 15:50 Temperature 71 ° F

Vehicle Model Year, Make, Model and Body Style:

2003 HYUNDAI SANTA FE MPVVehicle Test Weight: 4089 lbs.; Impact Velocity: 19.6 mph

Type of Front Occupant Restraint System Installed in Test Vehicle:

Driver's DSP: TYPE 2 BELT WITH FRONTAL AIR BAG IN STEERING WHEEL,
SIDE AIR BAGRight Passenger's DSP: TYPE 2 BELT WITH FRONTAL AIR BAG IN DASH,
SIDE AIR BAGStoddard solvent spillage from Vehicle's Fuel System: None

REMARKS: THE DRIVER SIDE AIR BAG DEPLOYED

RECORDED BY: [Signature]
APPROVED BY: [Signature]DATE: 05/29/03

DATA SHEET 1 **TEST VEHICLE SPECIFICATIONS**

TEST VEHICLE INFORMATION:

NHTSA No.: C30508
 Year/Make/Model/Body Style: 2003 HYUNDAI SANTA FE MPV
 Engine Data: 4 CYLINDER INLINE DOHC 2.4 LITERS
 Transmission Data: 5 SPEED MANUAL
 Final Drive Data: 4 WHEEL DRIVE
 Major Options: UTILITY PACKAGE
 Date Received: 03/06/03; Odometer Reading: 96 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: HYUNDAI MOTOR CO.
 Date of Manufacture: 11/02
 VIN: KM8SB12B83U411971

GVWR: 2208 kg (4870 lbs.); GAWR Front: 1199 kg (2645 lbs.) GAWR Rear: 1299 kg (2865 lbs.)

DATA FROM VEHICLE'S TIRE PLACARD:

Location of Placard on Vehicle: DRIVER'S "B" PILLAR
 Tire Pressure With Maximum Capacity Vehicle Load —
 Front: 32 psi; Rear: 32 psi
 Recommended Tire Size: P225/70R16
 Recommended Cold Tire Pressure: Front = 220 kPa (32 psi) Rear = 220 kPa (32 psi)
 Size of Tires on Test Vehicle: P225/70R16
 Type of Spare Tire: FULL SIZE

Vehicle Capacity Data —

Type of Front Seat(s): BUCKET
 Number of Occupants: Front = 2; Mid = Rear = 3; Total = 5

A. VEHICLE CAPACITY WEIGHT (VCW) =	<u>880</u>	lbs.
B. Number of Occupants x 150 lbs. =	<u>750</u>	lbs.
RATED CARGO AND LUGGAGE WEIGHT (RCLW) = A - B =	<u>130</u>	lbs.

RECORDED BY: [Signature]
 APPROVED BY: D. Messick

DATE: 05/27/03

DATA SHEET 2 **PRE-TEST DATA**

WEIGHT OF TEST VEHICLE:

A. As Received At Laboratory (Maximum Fluids) —

Right Front = 478.9 kg (1056 lbs.) Right Rear = 350.1 kg (772 lbs.)

Left Front = 491.6 kg (1084 lbs.) Left Rear = 334.2 kg (737 lbs.)

TOTAL FRONT = 970.6 kg (2140 lbs.) TOTAL REAR = 684.4 kg (1509 lbs.)

% of TOTAL = 59 % % of TOTAL = 41 %

TOTAL DELIVERED WEIGHT = 1655.1 kg (3649 lbs.)

B. Calculation of Target Test Weight —

1. Total Delivered Weight = 1655.1 kg (3649 lbs.)

2. Rated Cargo & Lugg. Weight (RCLW) = 59.0 kg (130 lbs.)

3. Weight of 2 Dummies (164 lbs. each) = 148.8 kg (328 lbs.)

TARGET TEST WEIGHT = 1 + 2 + 3 = 186.3 kg (4107 lbs.)

C. Vehicle, Dummies and 63.50 kg (140 lbs.) of Cargo Weight —

Right Front = 538.41 kg (1187 lbs) Right Rear = 394.62 kg (870 lbs)

Left Front = 506.20 kg (1116 lbs) Left Rear = 415.49 kg (916 lbs)

TOTAL FRONT = 1044.62 kg (2303 lbs) TOTAL REAR = 810.11 kg (1786 lbs)

% of TOTAL = 56 % % of TOTAL = 44 %

TOTAL TEST WEIGHT = 1854.73 kg (4089 lbs)

Weight of Ballast secured in cargo area = 63.50 kg (140 lbs)

Type of Ballast: SAND BAGS

Method of Securing Ballast: PASSENGER SEAT BELTS

Vehicle Components Removed for Weight Reduction:

NONE

DATA SHEET 2

PRE-TEST DATA CONTINUED

TEST VEHICLE ATTITUDE:

As Delivered — Right Front: 818 mm (32.2 inches)
 Left Front: 813 mm (32.0 inches)
 Right Rear: 846 mm (33.3 inches)
 Left Rear: 838 mm (33.0 inches)

As Tested — Right Front: 803 mm (31.6 inches)
 Left Front: 805 mm (31.7 inches)
 Right Rear: 820 mm (32.3 inches)
 Left Rear: 805 mm (31.7 inches)

Vehicle's Wheelbase = 2620 mm (103.1 inches)

FUEL SYSTEM DATA:

Fuel System Capacity Listed in Owner's Manual = 65 liters (17.2 gallons)
 Usable Capacity Figure Furnished By COTR = 65 liters (17.2 gallons)

Test Volume Range (91 to 94% of Usable Capacity) — 92.5%

59.4 liters (15.7 gallons) TO 61.3 liters (16.2 gallons)

ACTUAL TEST VOLUME = 60.2 liters (15.9 gallons) (with entire fuel system filled)

Test Fluid Type: Stoddard solvent
 Test Fluid Specific Gravity: .7583
 Test Fluid Kinematic Viscosity: 1.7 centistokes at 77° F
 Test Fluid Color: BLUE ("red" is preferred)
 Type of Vehicle Fuel Pump: ELECTRIC
 Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF —
YES

Details of Fuel System: ELECTRIC PUMP SUPPLYING FUEL INJECTORS
FUEL RAIL WITH LOW PRESSURE RETURN LINE TO FUEL TANK.

REMARKS:

RECORDED BY: *[Signature]*
 APPROVED BY: *[Signature]*

DATE: 05/27/03

DATA SHEET 3
POST IMPACT DATA

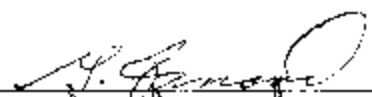
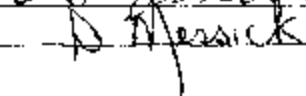
TYPE OF TEST: 301L
TEST DATE: 05/28/03 ; TIME: 15:50 ; TEMP.: 71 °F
VEH. NHTSA NO.: C30508 ; VIN: KM8SB12B83U411971

REQUIRED IMPACT VELOCITY RANGE: 18.9 to 19.9 mph

ACTUAL IMPACT VELOCITY: (speed traps located within 5 feet of impact plane)

Trap No. 1 = 19.65 mph Trap No. 2 = 19.60 mph
Average Impact Speed = 19.6 mph

REMARKS:

RECORDED BY: 
APPROVED BY: 

DATE: 05/28/02

DATA SHEET 4
SUMMARY OF FMVSS 301 DATA

TEST VEHICLE NHTSA NO.: C30508 ; TEST DATE: 05/28/03

VEHICLE YEAR/MAKE/MODEL/BODY STYLE:

2003 HYUNDAI SANTA FE

TYPE OF IMPACT: 301L

STODDARD SOLVENT SPILLAGE MEASUREMENT:

A. From impact until vehicle motion ceases —

Actual = 0 oz. Maximum Allowable = 1 ounce

B. For 5 minute period after vehicle motion ceases —

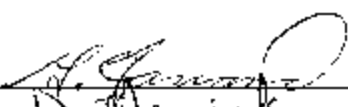
Actual = 0 oz. Maximum Allowable = 5 ounces

C. For next 25 minutes —

Actual = 0 oz. Maximum Allowable = 1 oz./minute

D. Provide Spillage Details: NONE

REMARKS:

RECORDED BY: 
APPROVED BY: D. Messick

DATE: 05/28/03

DATA SHEET 5
STATIC ROLLOVER TEST DATA:

A. Test Phase = 0° to 90°

Determination of Stoddard Solvent
 Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1
 minutes, 35 seconds

(Specified Range is 1 to 3
 minutes)

2. FMVSS 301 Position Hold
 Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 35 seconds

4. NEXT WHOLE MINUTE INTERVAL =
7 minutes

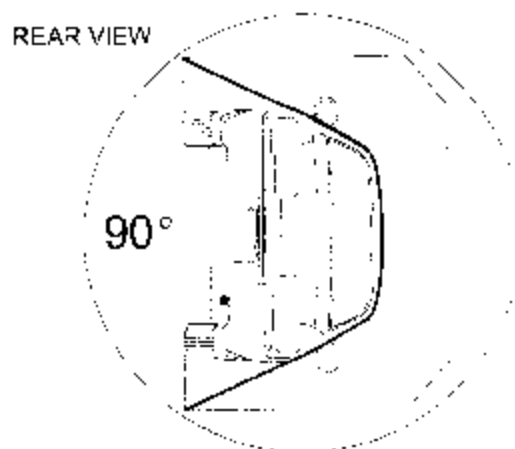
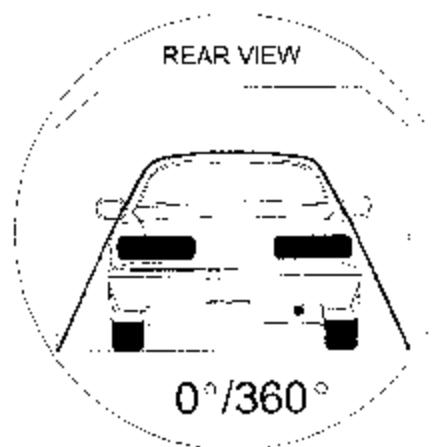
Actual Test Vehicle Stoddard Solvent
 Spillage:

1. First 5 minutes from onset of
 rotation = 0 oz.
 (5 oz. allowed)

2. 6th minute = 0 oz.
 (1 oz. allowed)

3. 7th minute = 0 oz.
 (1 oz. allowed)

4. 8th minute (if required) = N/A oz. (1 oz. allowed)



Provide Details of Stoddard Solvent Spillage Locations — NONE

DATA SHEET 5 CONTINUED

B. Test Phase = 90° to 180°

Determination of Stoddard
Solvent Collection Time Period:

1. Rollover Fixture 90°
Rotation Time = 1 __ minutes,
__33__ seconds

(Specified Range is 1 to 3
minutes)

2. FMVSS 301 Position Hold
Time = 5 minutes, 0 seconds

3. TOTAL = 6 __ minutes, __33__ seconds

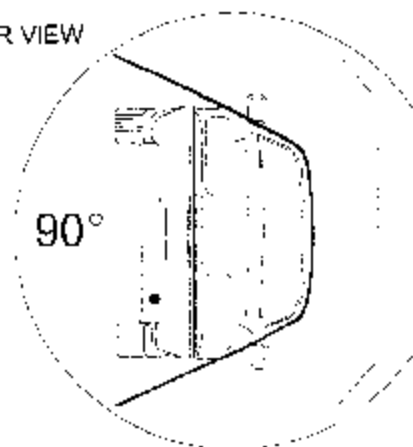
4. NEXT WHOLE MINUTE INTERVAL =
__7__ minutes

Actual Test Vehicle Stoddard
Solvent Spillage:

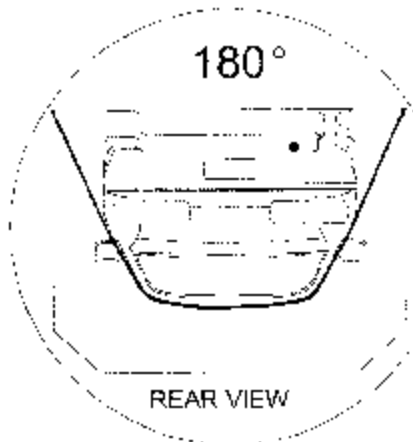
1. First 5 minutes from onset of
rotation = __0__ oz.
(5 oz. allowed)
2. 6th minute = __0__ oz.
(1 oz. allowed)
3. 7th minute = __0__ oz.
(1 oz. allowed)
4. 8th minute (if required) = N/A oz. (1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations — NONE

REAR VIEW

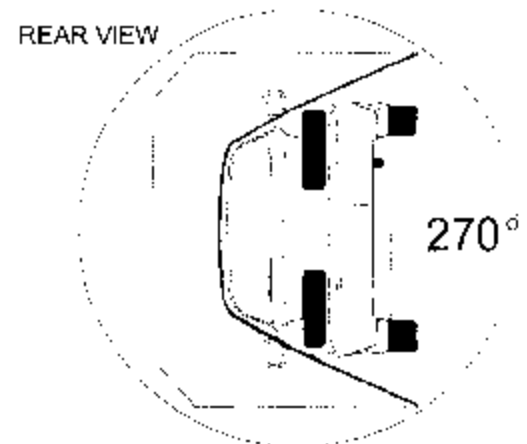
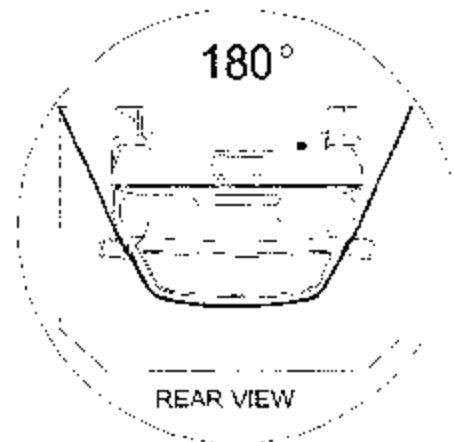


180°



DATA SHEET 5 CONTINUED

C. Test Phase = 180° to 270°

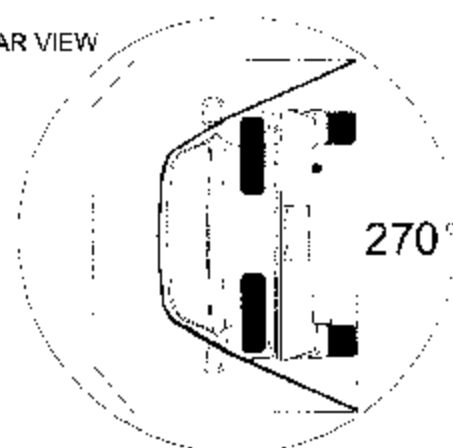
Determination of Stoddard
Solvent Collection Time Period:1. Rollover Fixture 90°
Rotation Time = 1 minutes,
29 seconds(Specified Range is 1 to 3
minutes)2. FMVSS 301 Position Hold
Time = 5 minutes, 0 seconds3. TOTAL = 6 minutes, 29 seconds4. NEXT WHOLE MINUTE
INTERVAL = 7 minutesActual Test Vehicle Stoddard
Solvent Spillage:1. First 5 minutes from onset of
rotation = 0 oz.
(5 oz. allowed)2. 6th minute = 0 oz.
(1 oz. allowed)3. 7th minute = 0 oz.
(1 oz. allowed)4. 8th minute (if required) = N/A oz. (1 oz. allowed)Provide Details of Stoddard Solvent Spillage Locations — NONE

DATA SHEET 5 CONTINUED

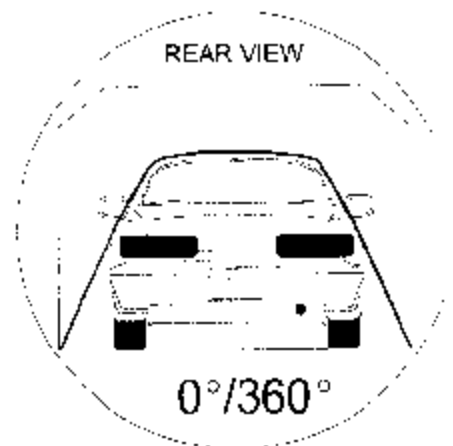
D. Test Phase = 270° to 360°

Determination of Stoddard
Solvent Collection Time Period:1. Rollover Fixture 90°
Rotation Time = 1 minutes,
40 seconds(Specified Range is 1 to 3
minutes)2. FMVSS 301 Position Hold
Time = 5 minutes, 0 seconds3. TOTAL = 6 minutes, 40 seconds4. NEXT WHOLE MINUTE INTERVAL =
7 minutesActual Test Vehicle Stoddard
Solvent Spillage:1. First 5 minutes from onset of
rotation = 0 oz.
(5 oz. allowed)2. 6th minute = 0 oz.
(1 oz. allowed)3. 7th minute = 0 oz.
(1 oz. allowed)4. 8th minute (if required) = N/A oz. (1 oz. allowed)Provide Details of Stoddard Solvent Spillage Locations — NONE

REAR VIEW



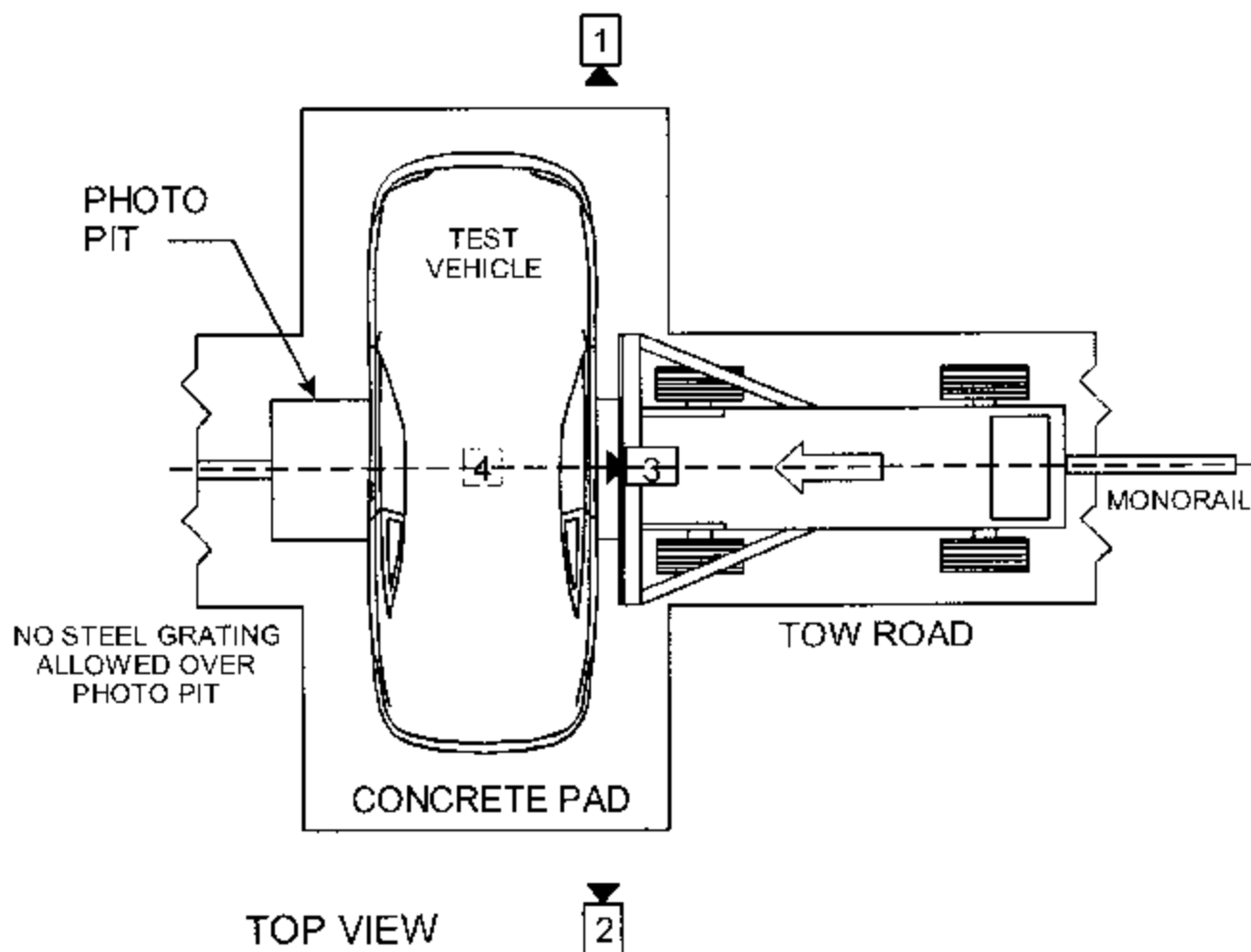
REAR VIEW



DATA SHEET 6 CAMERA LOCATION

VEHICLE NHTSA NO.: C30508

TEST DATE: 05/28/03



- CAMERA 1 – REAR SIDE VIEW OF VEHICLE DURING CRASH
- CAMERA 2 – FRONT SIDE VIEW OF VEHICLE DURING CRASH
- CAMERA 3 – OVERHEAD VIEW OF ENTIRE IMPACT
- CAMERA 4 – UNDERBODY VIEW OF FUEL TANK LOCATED IN PIT

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

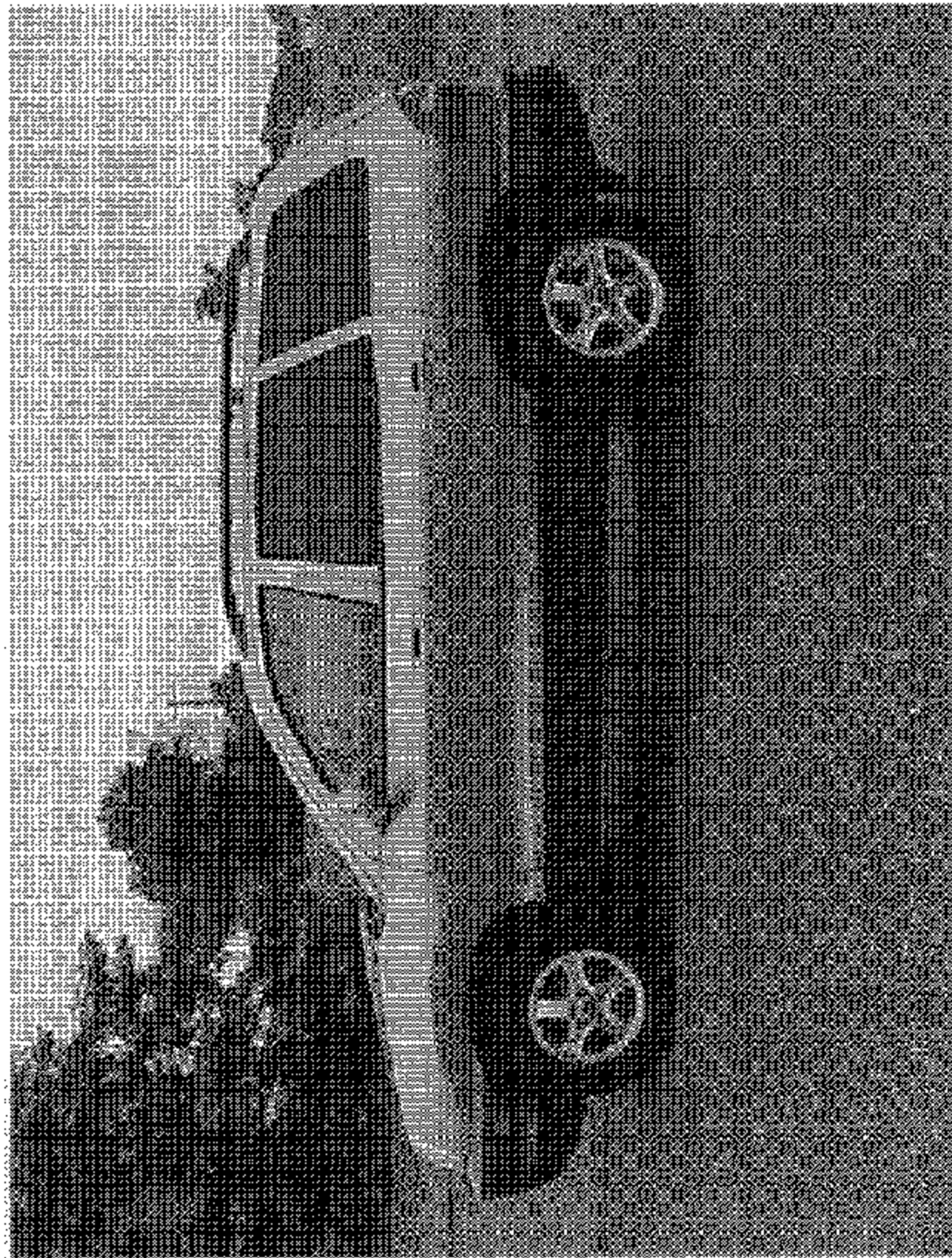
EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
COUNTER/TIMER	SYSTRON DONNER	19 353-10	04/03	04/04
COUNTER/TIMER	SYSTRON DONNER	19 353- 11	03/03	03/04
SPEED TRAP 2	GTL ST1	N/A	08/02	08/03
SPEED TRAP 3	GTL ST2	N/A	08/02	08/03
STOP WATCH	ACCUSPLIT	ACT 1 A&B	05/03	05/04
STOP WATCH	ACCUSPLIT	ACT 2 A&B	05/03	05/04
SCALES	INTERCOMP	199744	05/03	05/04
TIRE PRESSURE GAUGE	WEKSLER	0-100	05/03	05/04
STEEL SCALES	STARRETT	C416R	05/03	05/04
STEEL TAPE	STANLEY	GF2	05/03	05/04
LEVEL	STANLEY	42-449	05/03	05/04
TEMP. INDICATOR	OMEGA	B/5562/14/1	05/03	05/04
TEMP. RECORDER	OMEGA	B/5562/14/1	05/03	05/04
SCALES	FAIRBANKS	N/A	06/02	06/03

SECTION 5
PHOTOGRAPHS



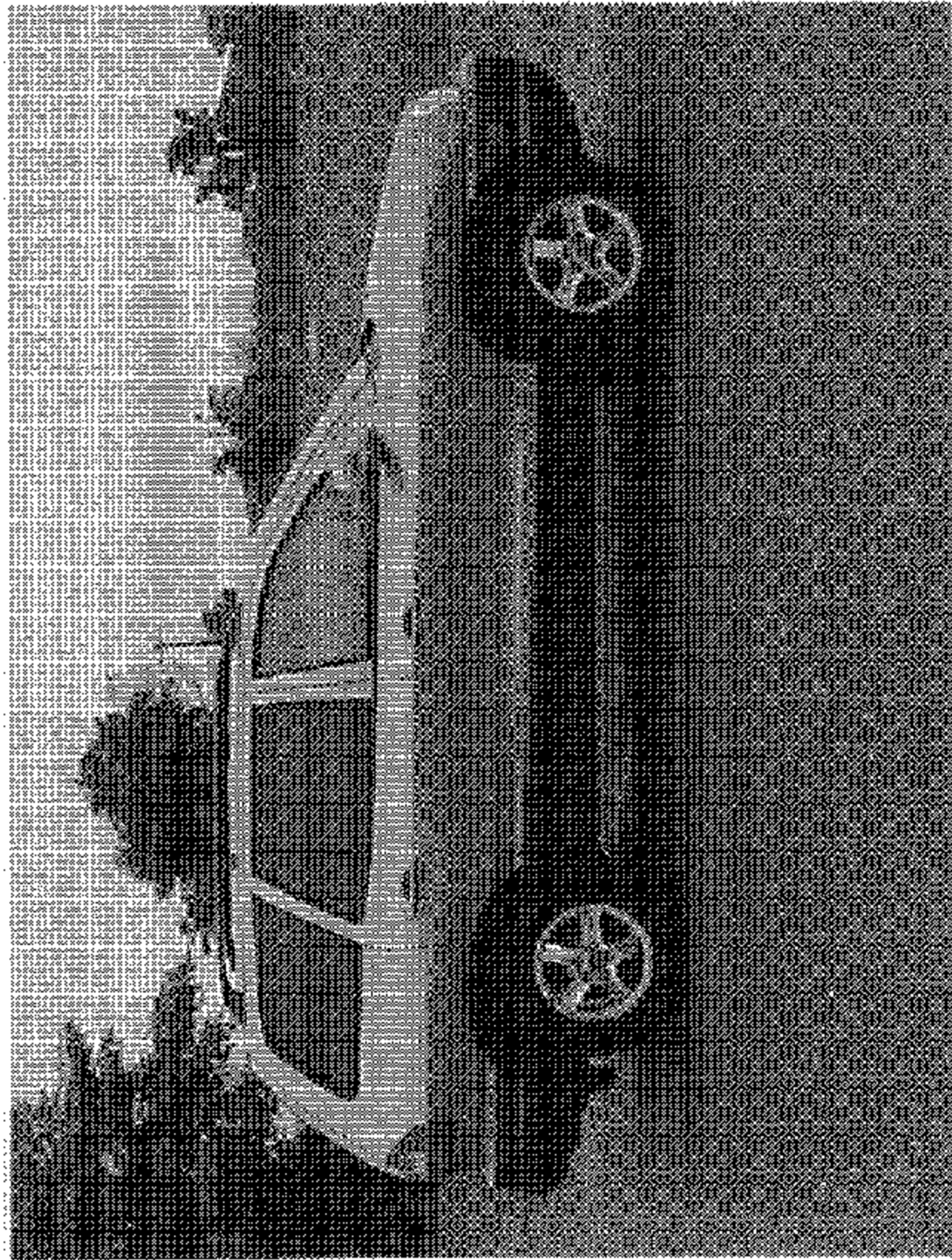
2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.1
FRONT VIEW OF VEHICLE PRE-TEST



2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 3.2
LEFT SIDE VIEW OF VEHICLE PRE-TEST



2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.3
RIGHT SIDE VIEW OF VEHICLE PRE-TEST

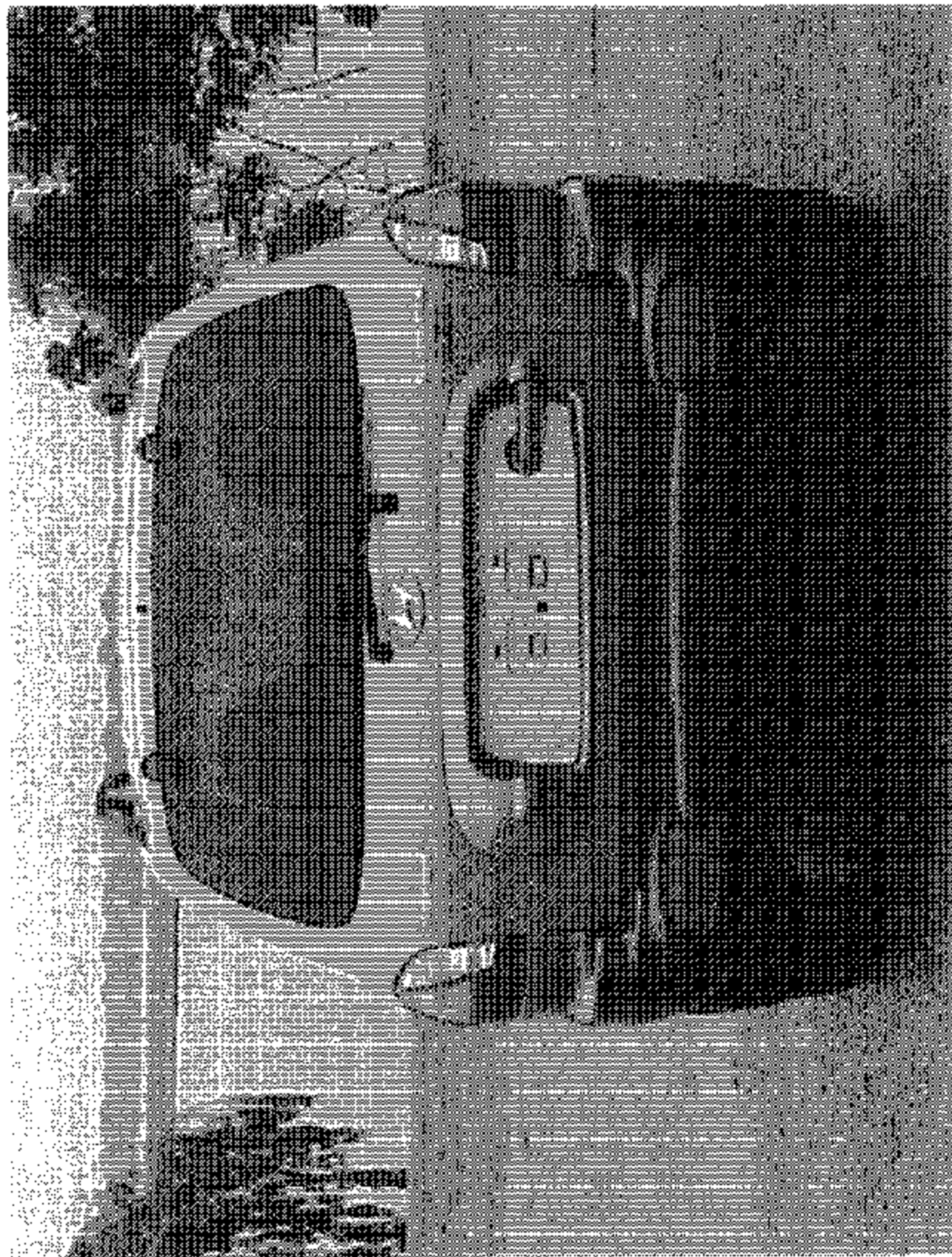
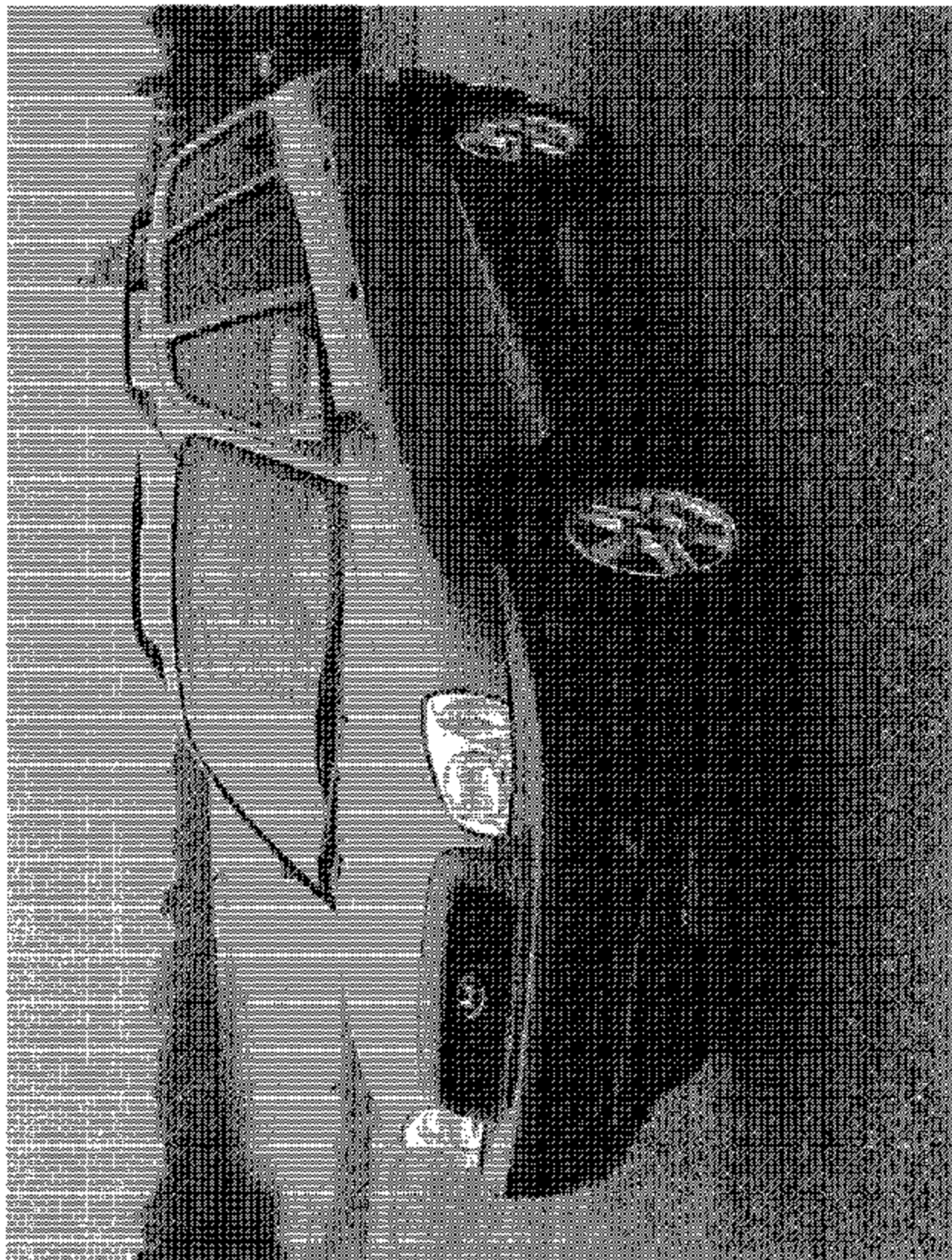


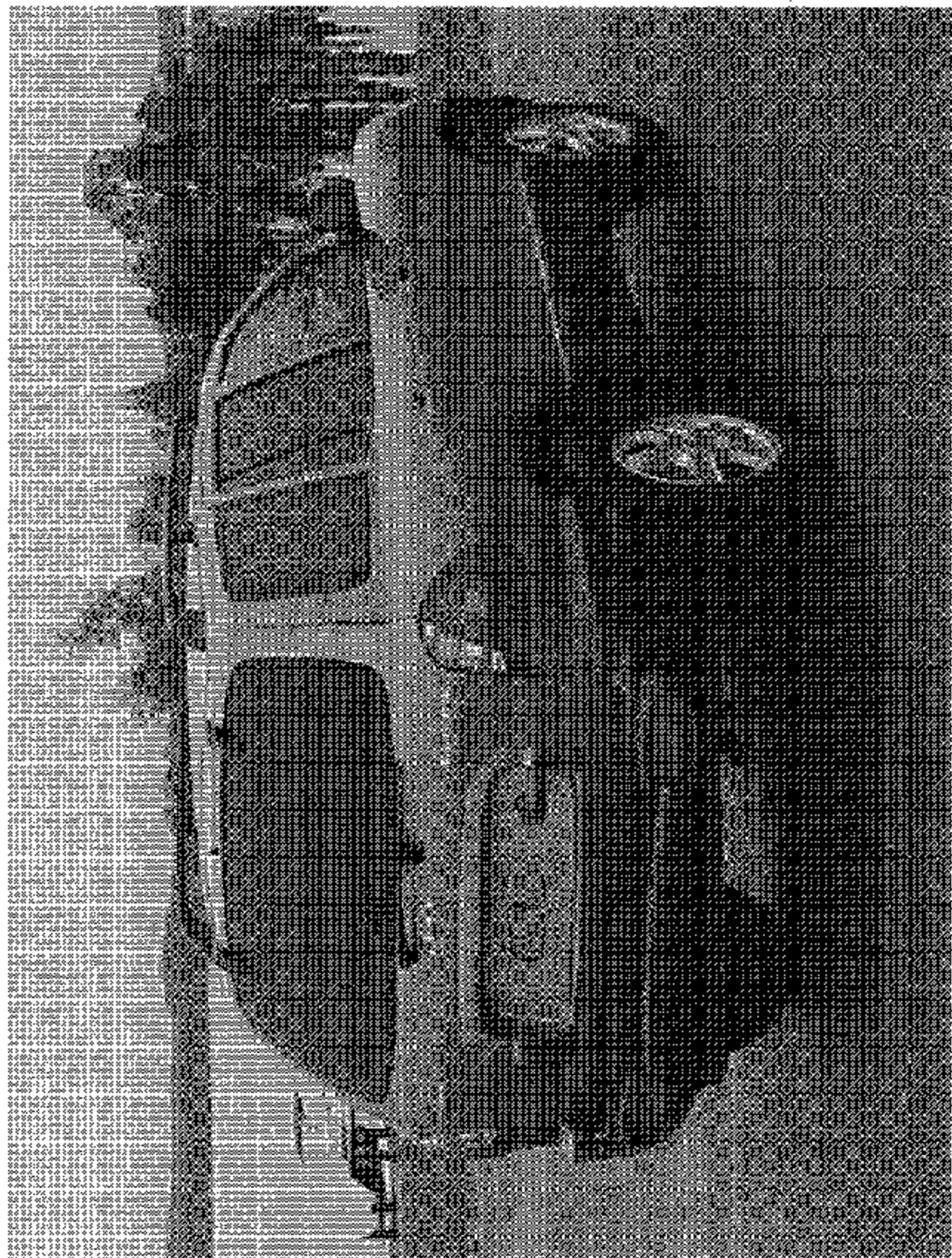
FIGURE 5.4
REAR VIEW OF VEHICLE PRE-TEST

2003 HYUNDAI SANTA FE
NJHSA NO. C30508
FMVSS NO. 301L



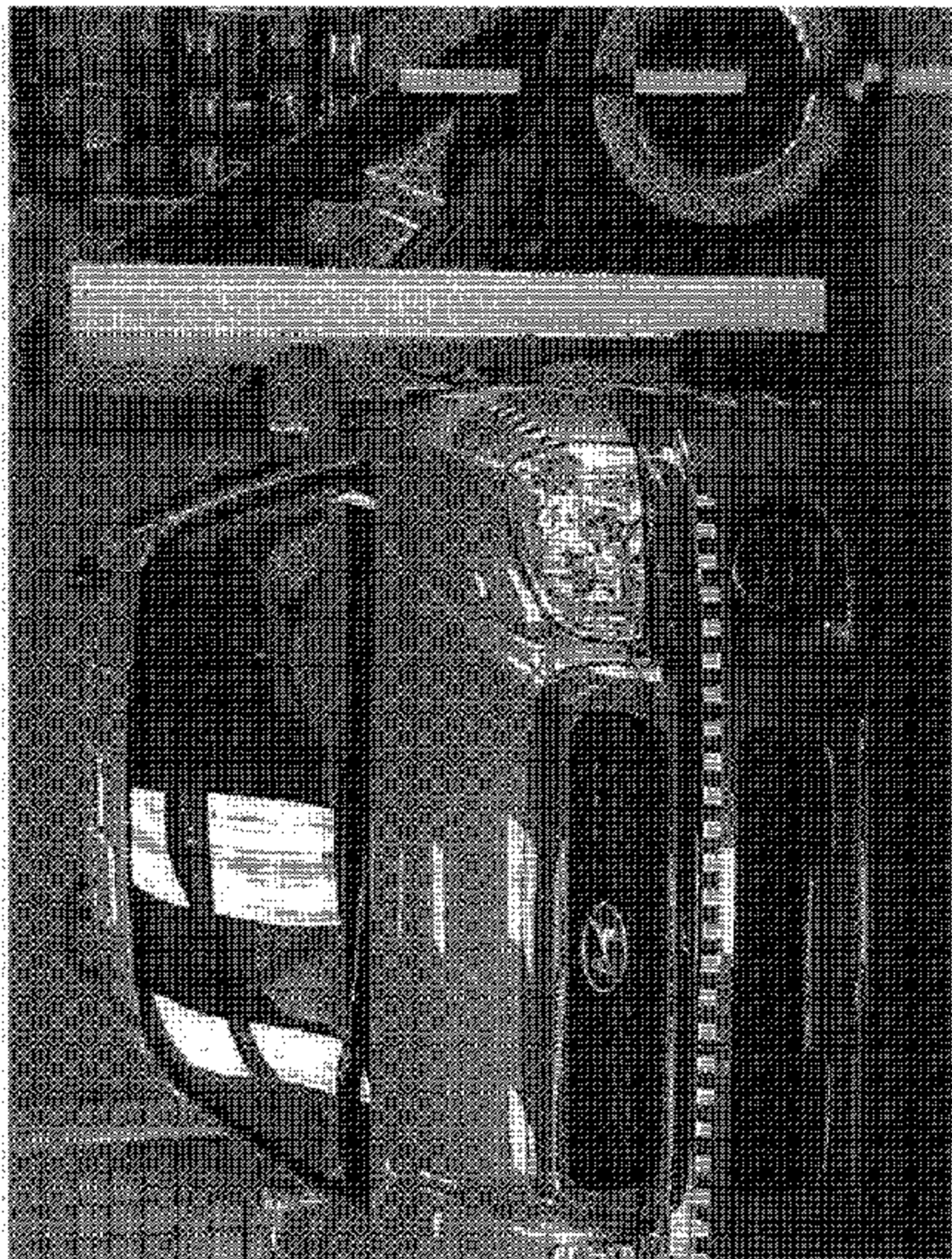
2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.5
¼ FRONTAL VIEW FROM LEFT SIDE OF
VEHICLE PRE-TEST



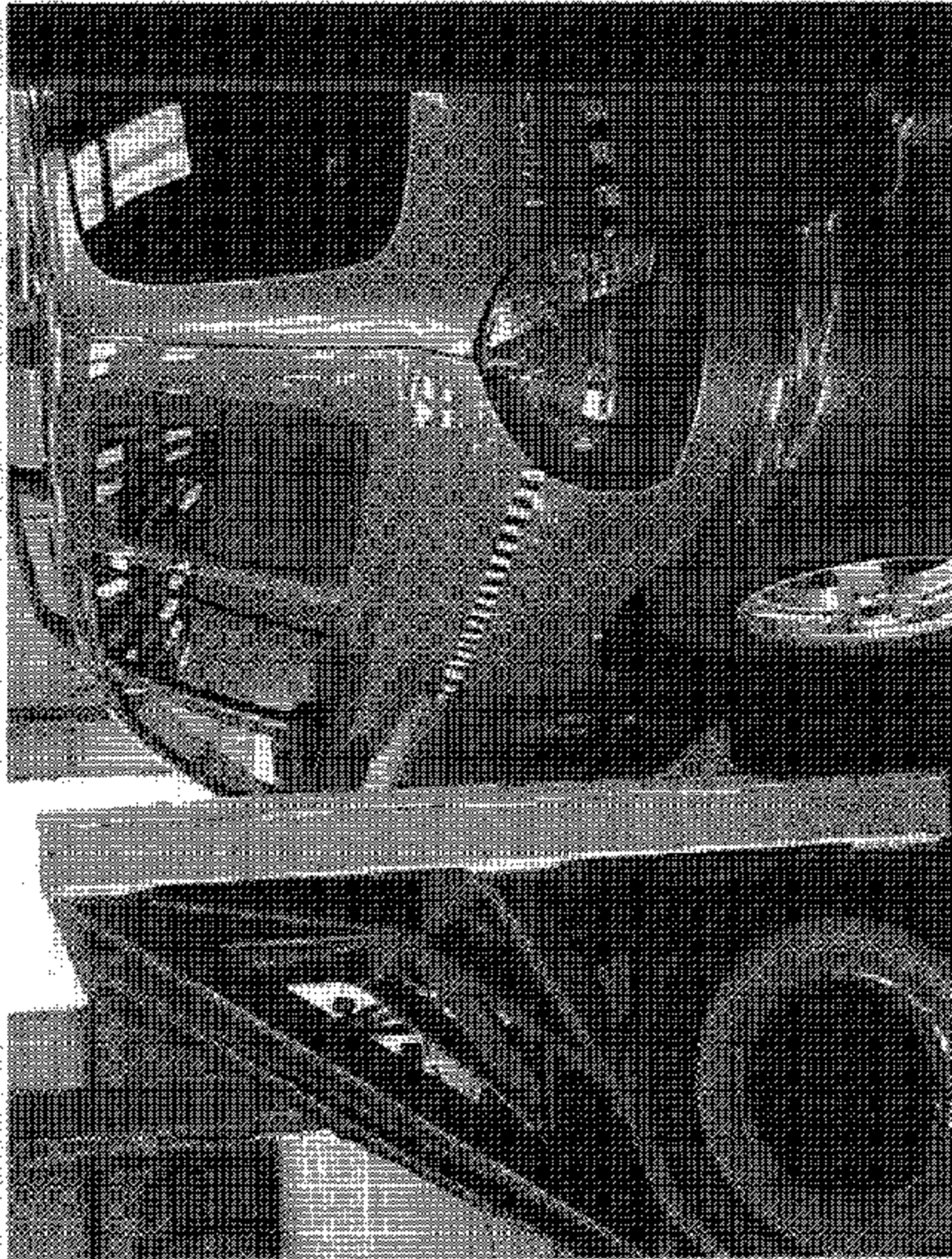
2003 HYUNDAI SANTA FE
NHTSA NO. C30308
FMVSS NO. 301L

FIGURE 5.6
¾ REAR VIEW FROM RIGHT SIDE OF
VEHICLE PRE-TEST



2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 57
LEFT VIEW OF VEHICLE/BARRIER
PRE-TEST



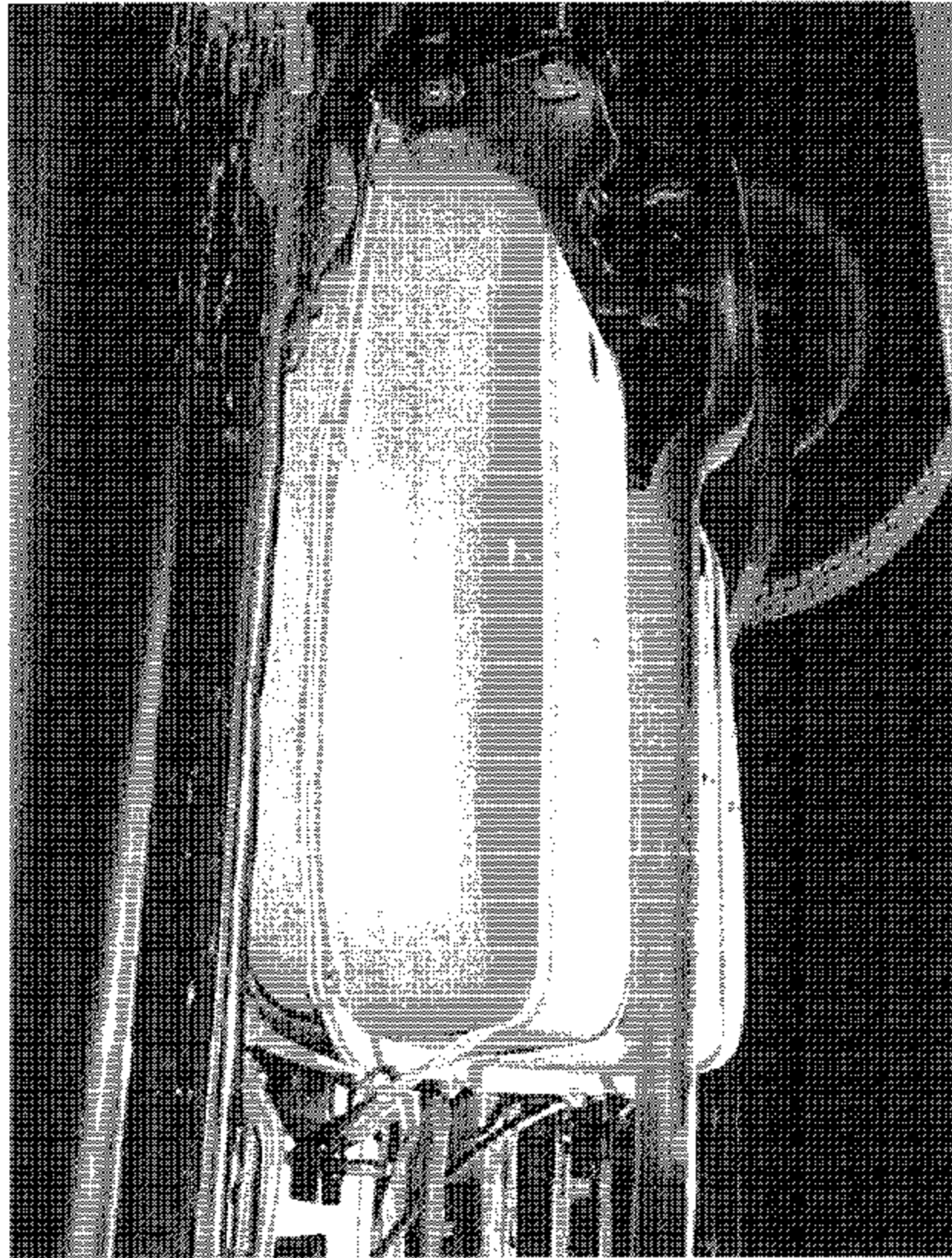
2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.8
RIGHT VIEW OF VEHICLE/BARRIER
PRE-TEST



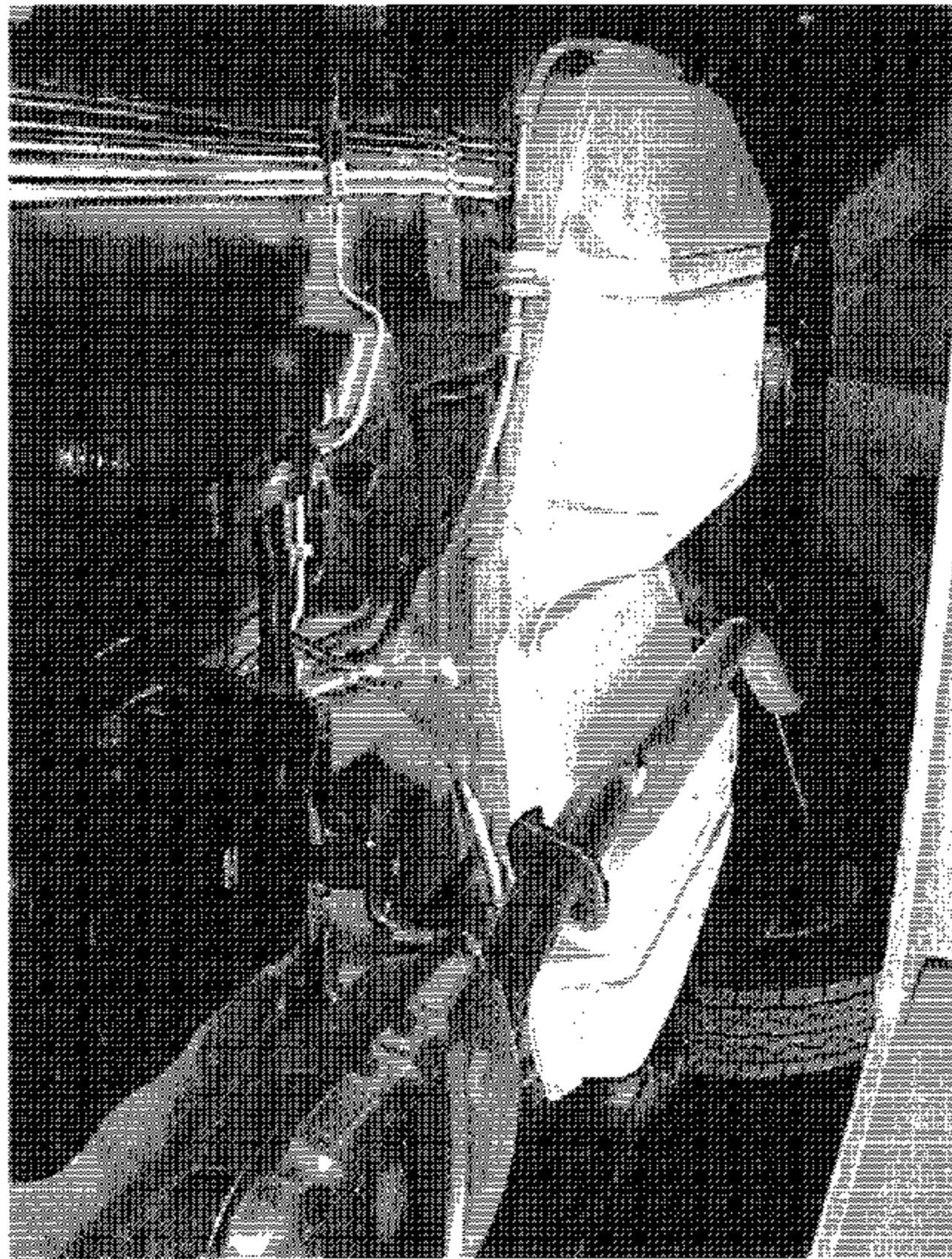
2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.9
UNDERBODY VIEW OF FUEL TANK RIGHT
VIEW PRE-TEST



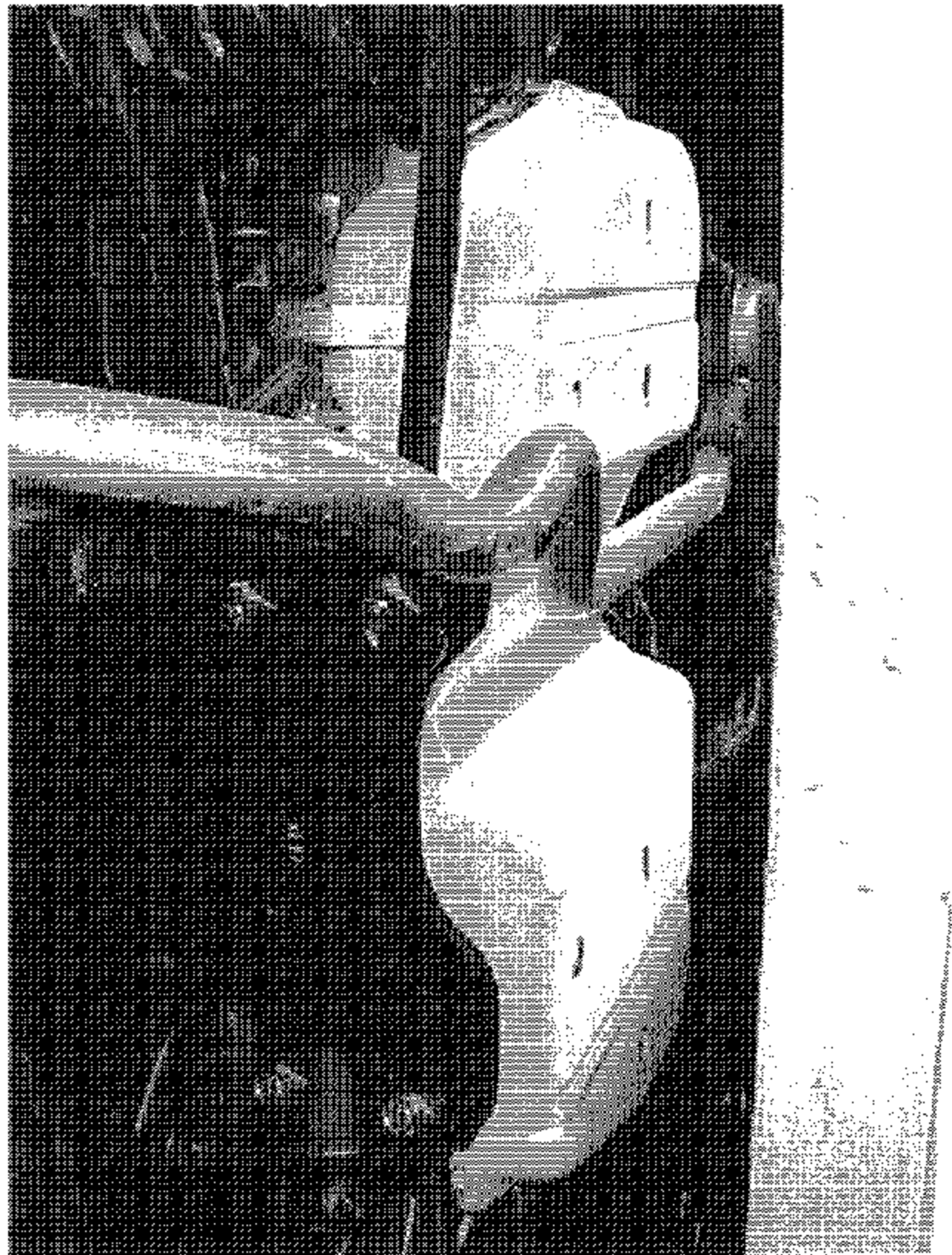
2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.10
UNDERBODY VIEW OF FUEL TANK LEFT
VIEW PRE-TEST



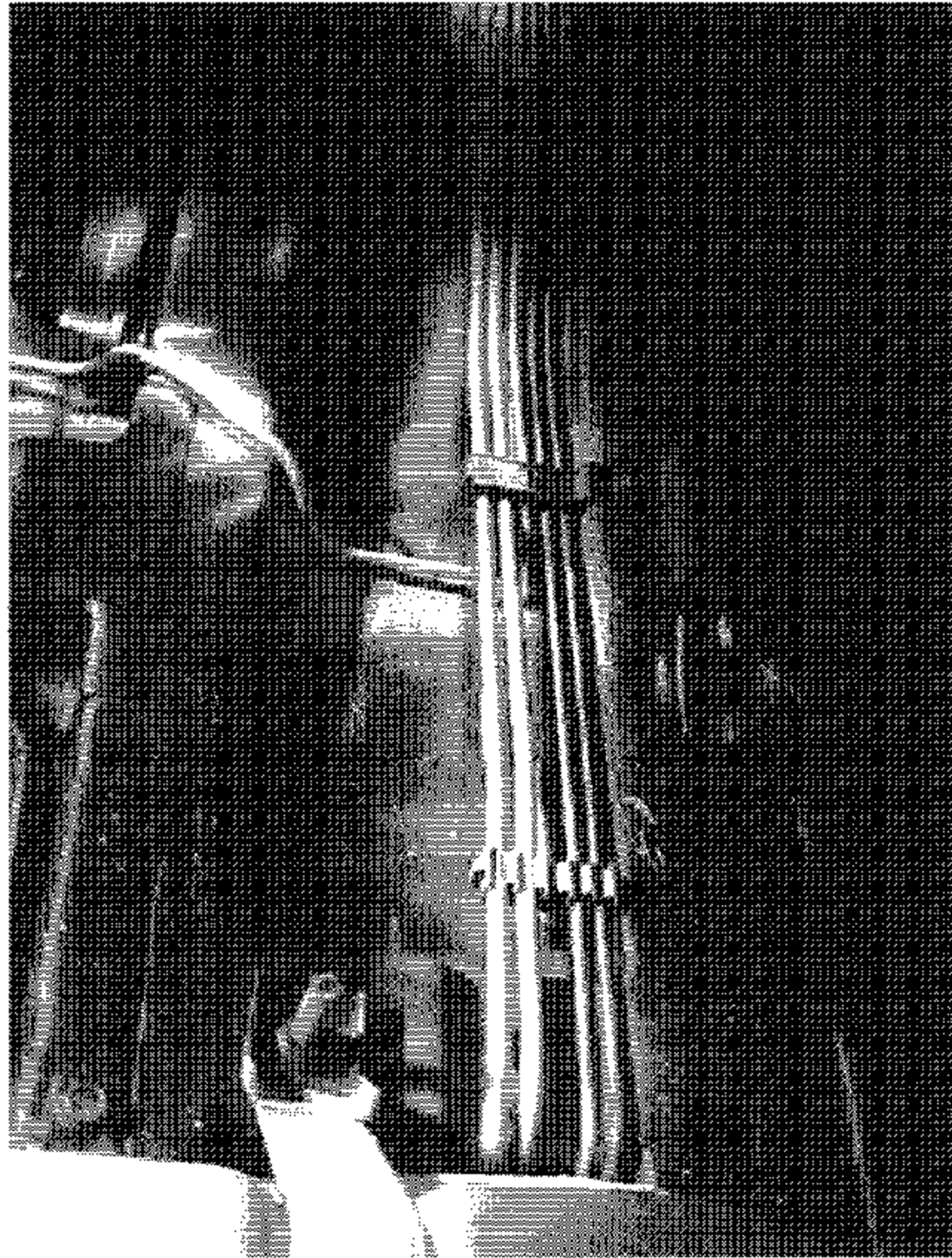
2003 HYUNDAI SANTA FE
NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.11
UNDERBODY VIEW OF FUEL TANK FRONT
VIEW PRE-TEST



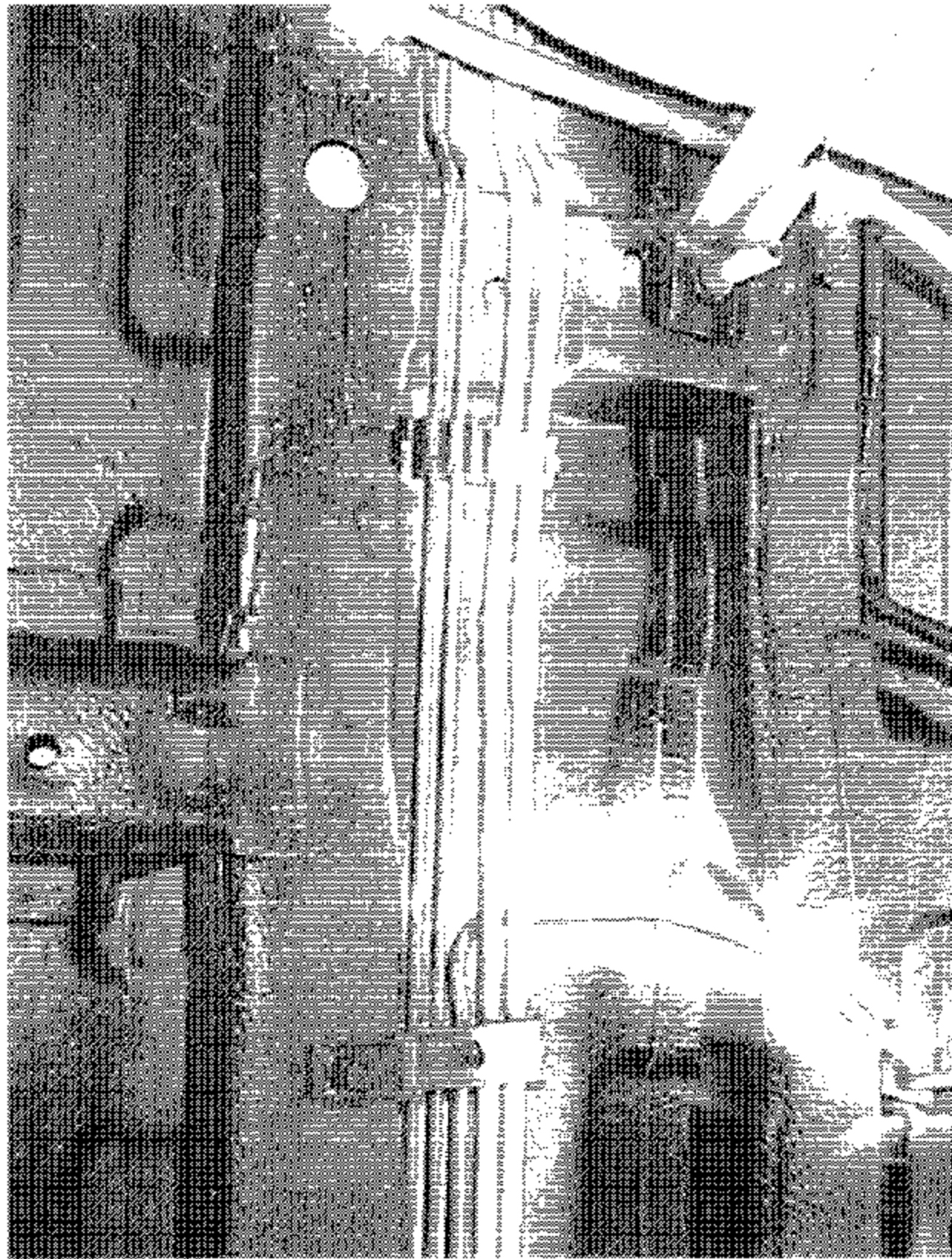
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FIGURE 5.12
UNDERBODY VIEW OF FUEL TANK REAR
VIEW PRE-TEST



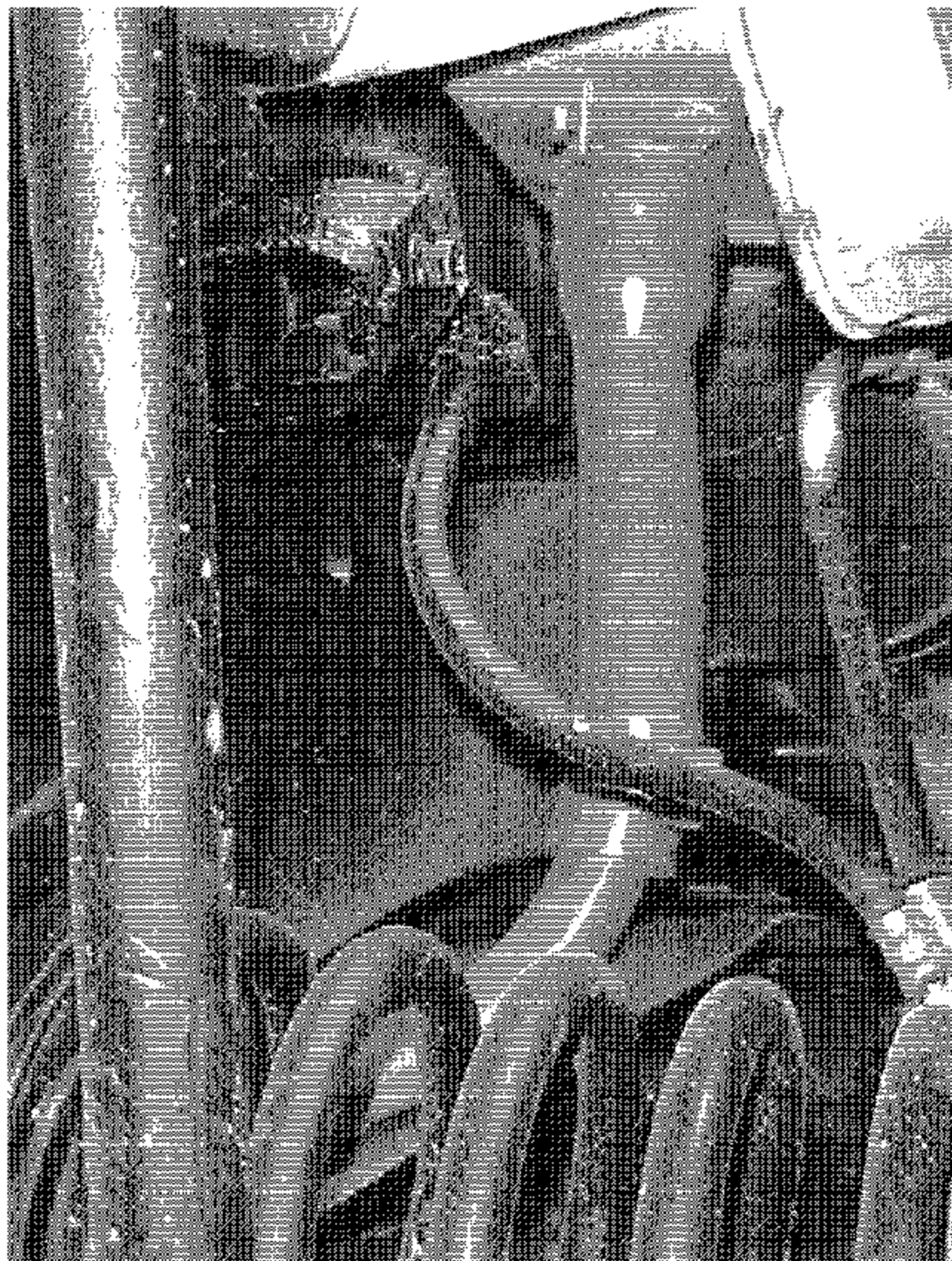
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FIGURE 5.13
UNDERBODY VIEW OF FUEL LINES AT
FRONT PRE-TEST



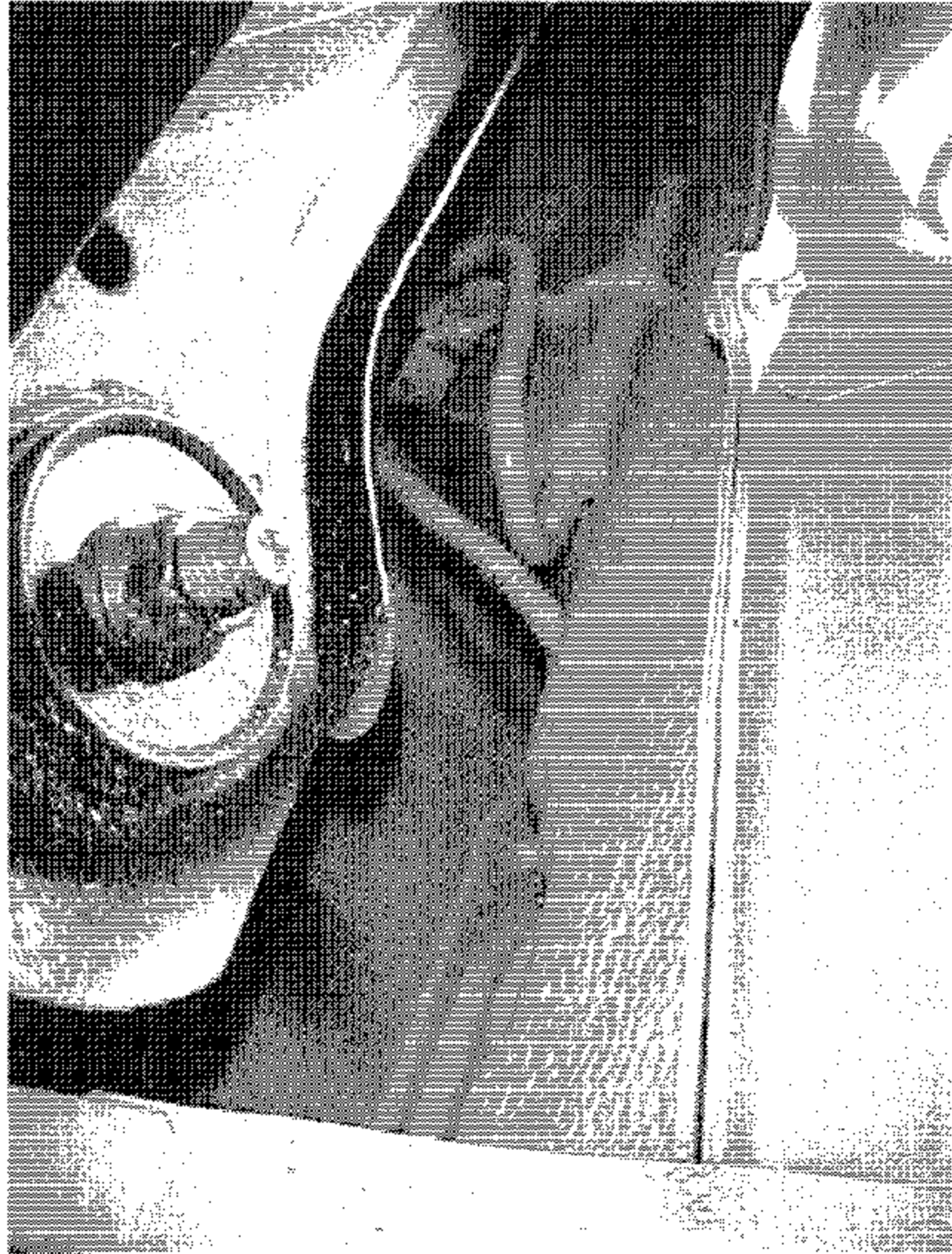
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FIGURE 5.14
UNDERBODY VIEW OF FUEL LINES AT
TANK PRE-TEST



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FIGURE 5.15
UNDERBODY VIEW OF FUEL FILL HOSE
PRE-TEST



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FIGURE 5.16
UNDERBODY VIEW OF FUEL VAPOR LINES
PRE-TEST



NOV/20/02

GVWR 2645 lbs

GVWR 2865 lbs

GVWR 4870 lbs

GVWR 2865 lbs

GVWR 4870 lbs

GVWR 2865 lbs

GVWR 4870 lbs

GVWR 2865 lbs

GVWR 4870 lbs

MANUFACTURED IN KOREA BY

HYUNDAI MOTOR COMPANY

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL

SAFETY AND EMISSION STANDARDS

THIS VEHICLE SAFETY AND EMISSION STANDARDS

IN EFFECT ON THE DATE OF MANUFACTURE

IN EFFECT ON THE DATE OF MANUFACTURE

IN EFFECT ON THE DATE OF MANUFACTURE

IN EFFECT ON THE DATE OF MANUFACTURE

IN EFFECT ON THE DATE OF MANUFACTURE

IN EFFECT ON THE DATE OF MANUFACTURE

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NHTSA NO. C39508
FMVSS NO. 301L

FIGURE 5.17
VEHICLE CERTIFICATION LABEL

5

TIRE INFLATION PRESSURE

La pression de gonflage des pneus

VEHICLE CAPACITY WEIGHT: 4004K(880LBS)
 Poids en lb de la capacité du véhicule: 400(880)
 SEATING CAPACITY: TOTAL 5 FRONT 2 REAR 3
 Capacité de transport: total 5; 2 à l'avant
 3 à l'arrière

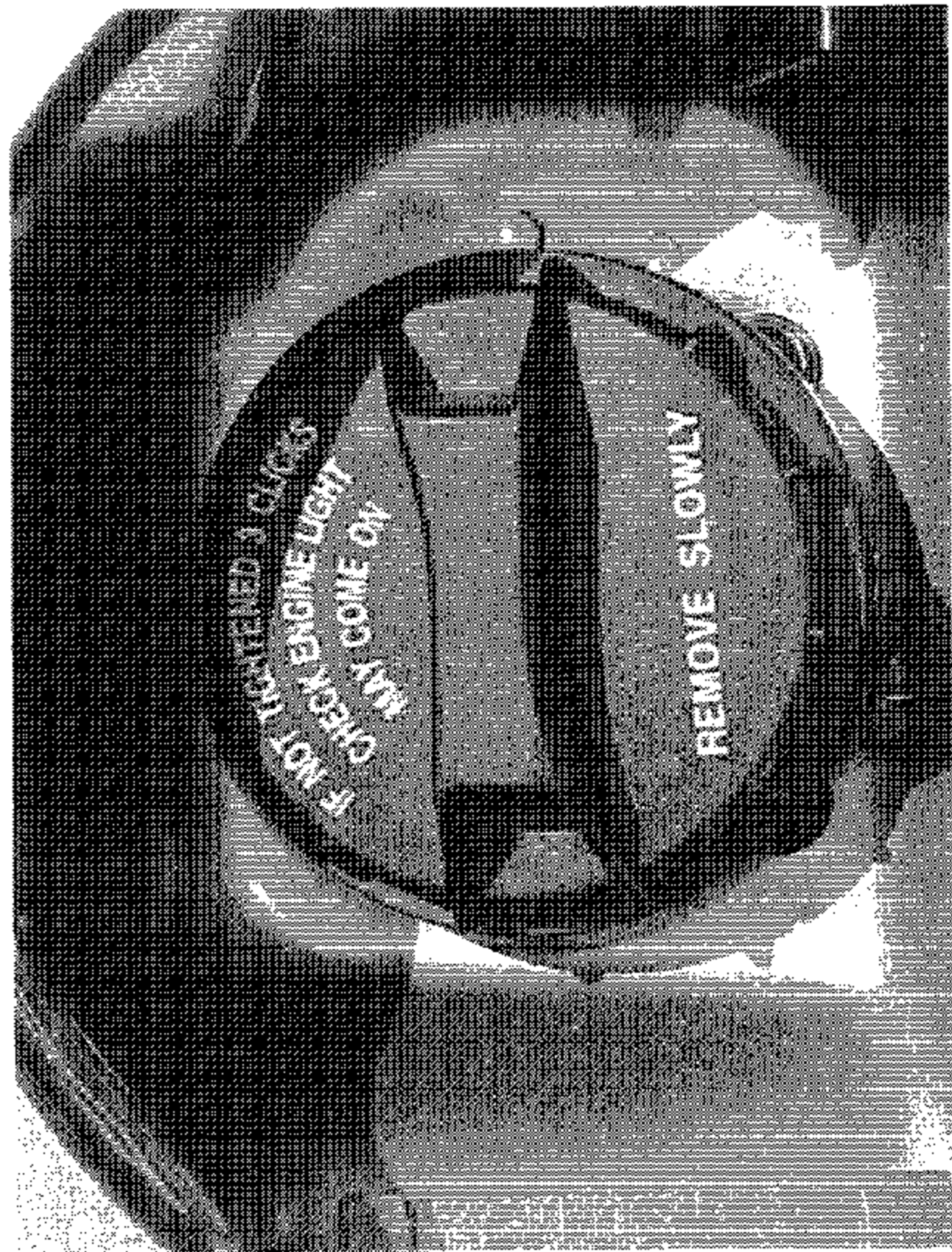
TIRE PRESSURES - COLD. KPA(PSI):

Pression de gonflage à froid kPa(lb/po2)

TIRE SIZE Dimension	UP TO 2 PERSONS Jusqu'à 2 Personnes		UP TO MAX. LOAD POUR CHARGE maximale	
	FRONT avant	REAR arrière	FRONT avant	REAR arrière
P185/70R14	230K(33PSI)	230K(33PSI)	230K(33PSI)	230K(33PSI)

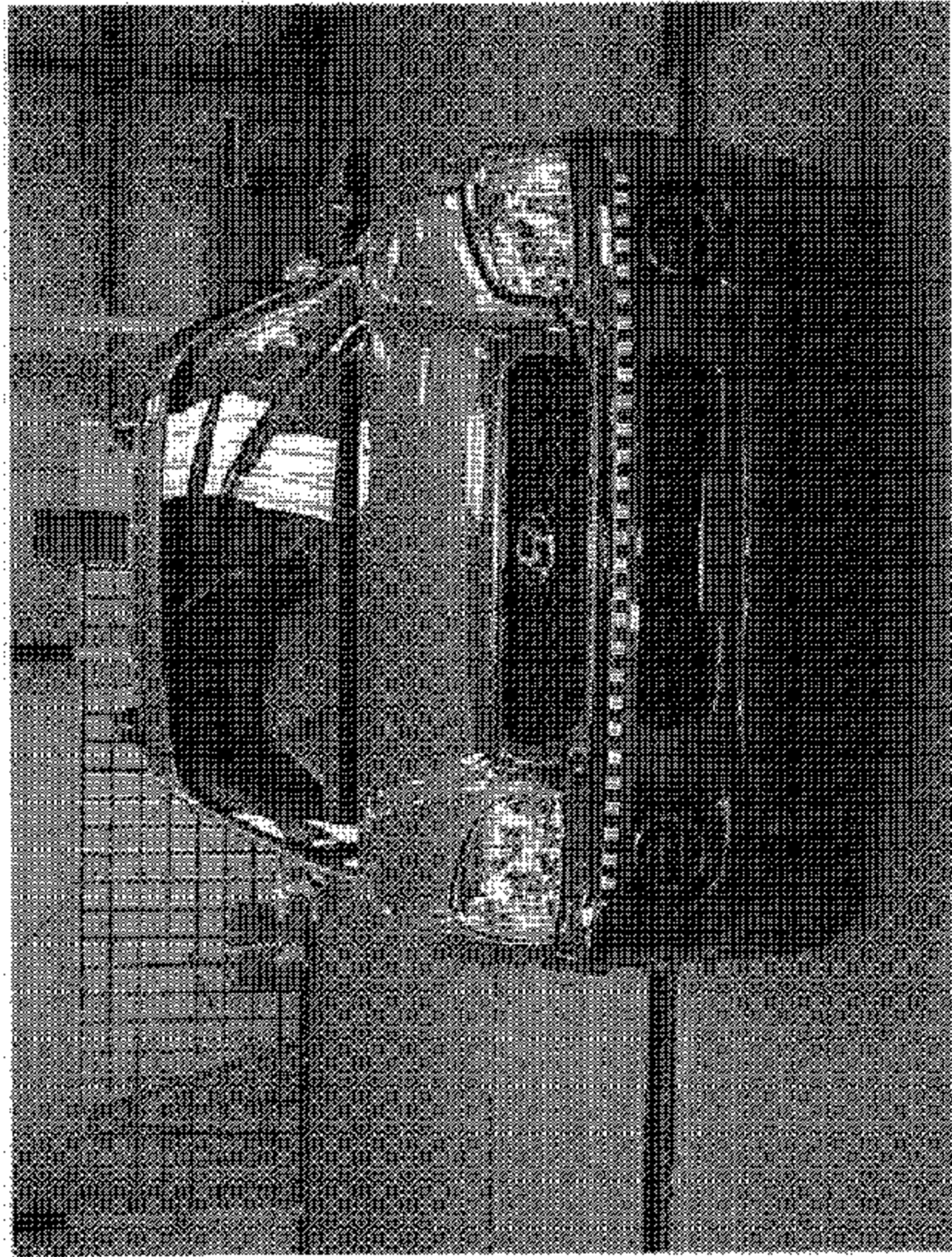
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FIGURE 5.18
 VEHICLE TIRE INFORMATION LABEL



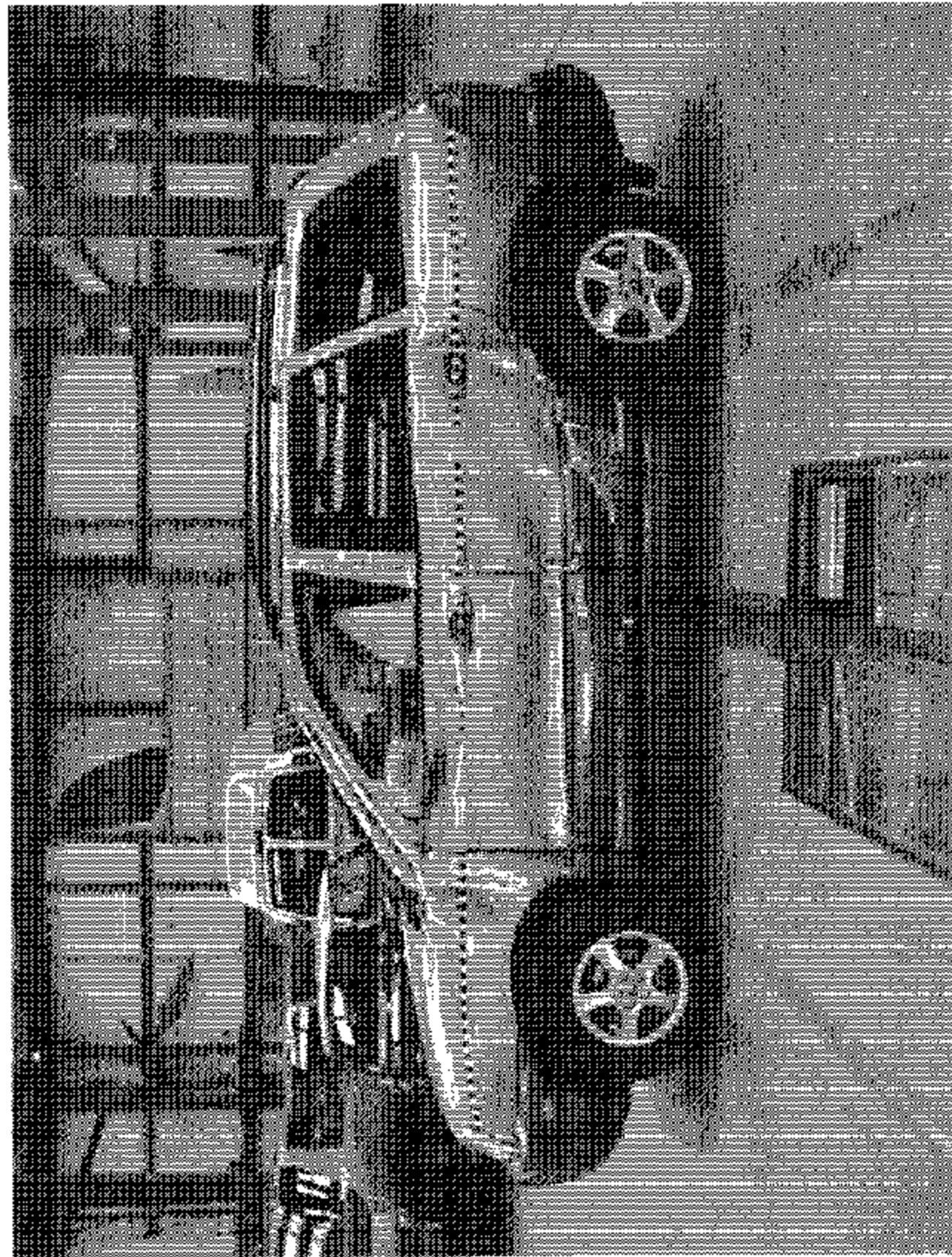
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FMVSS NO. 301L

FIGURE 5.19
VEHICLE FUEL CAP PRE-TEST



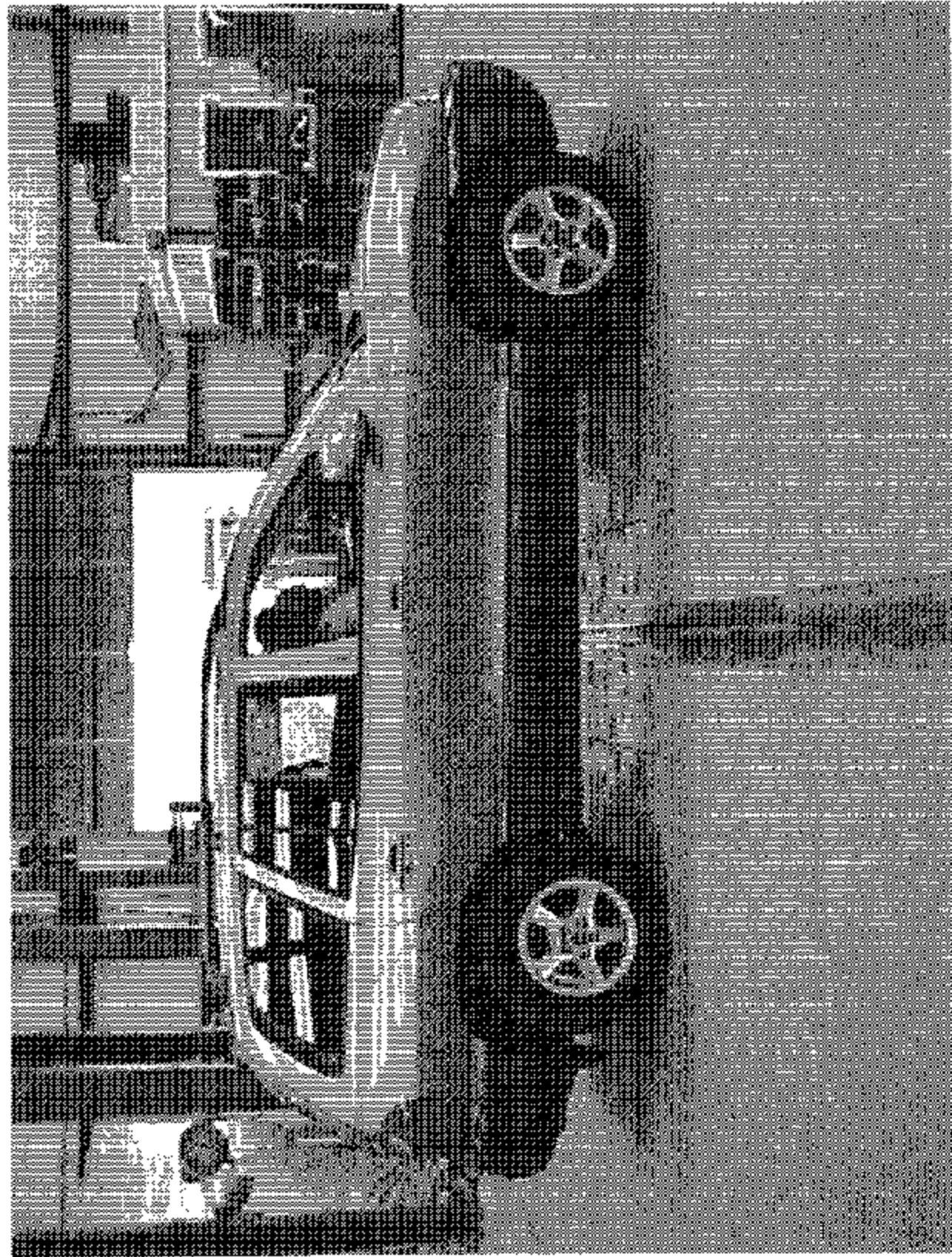
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NHISA NO. C30508
FMVSS NO. 301L

FIGURE 520
FRONT VIEW OF VEHICLE POST TEST



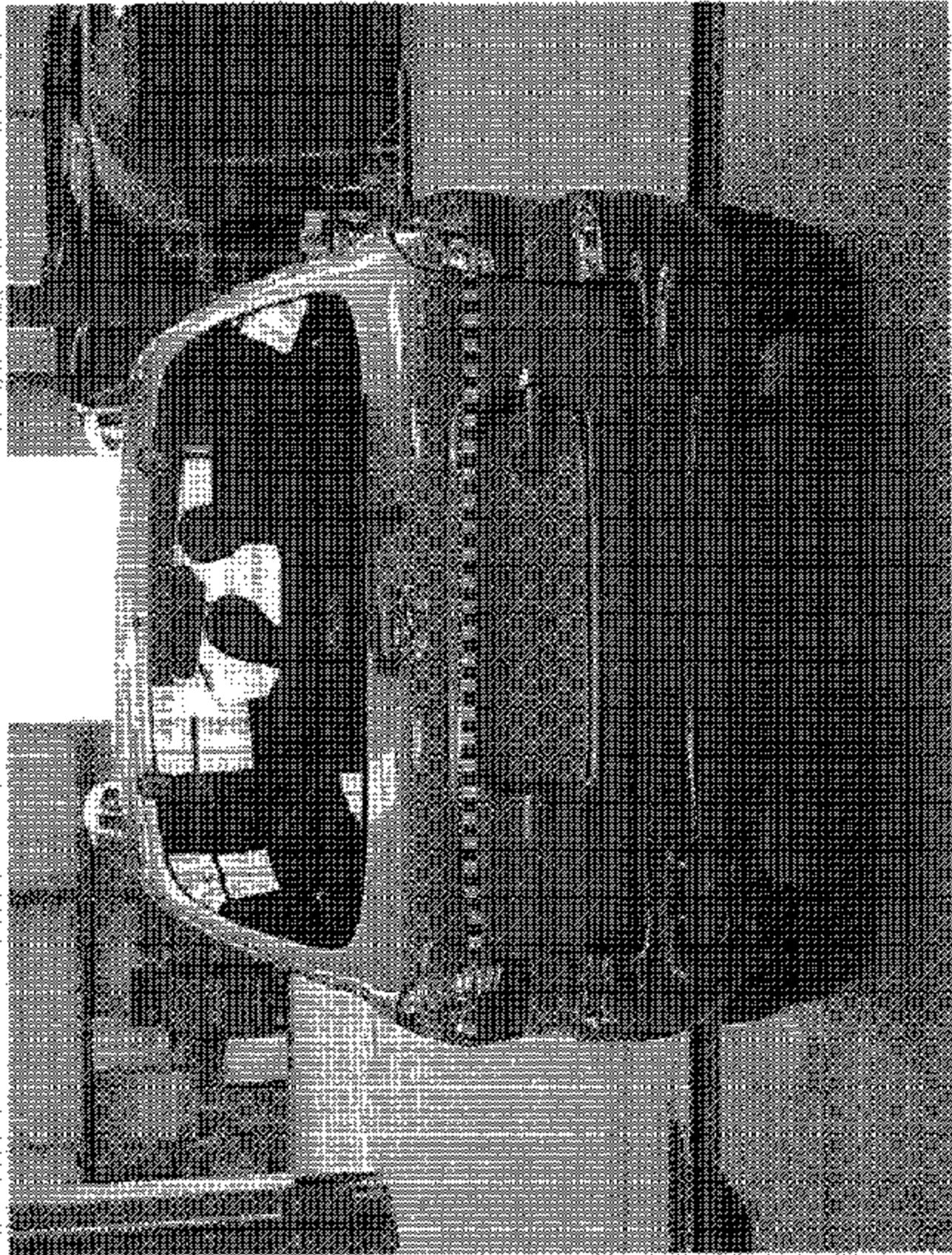
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FIGURE 5.21
LEFT SIDE VIEW OF VEHICLE POST TEST



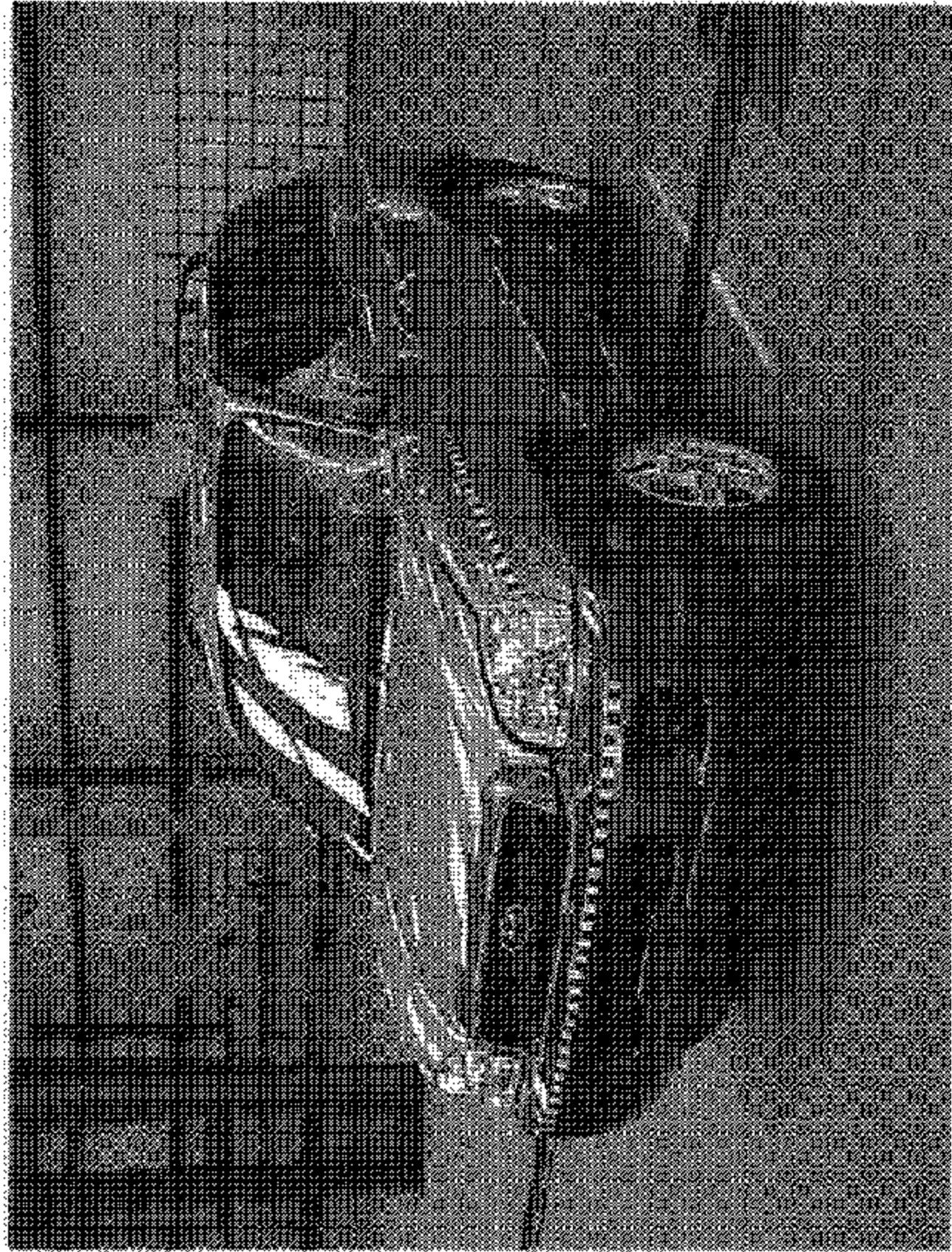
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NHISA NO. C30508
FMVSS NO. 301L

FIGURE 5.22
RIGHT SIDE VIEW OF VEHICLE POST TEST



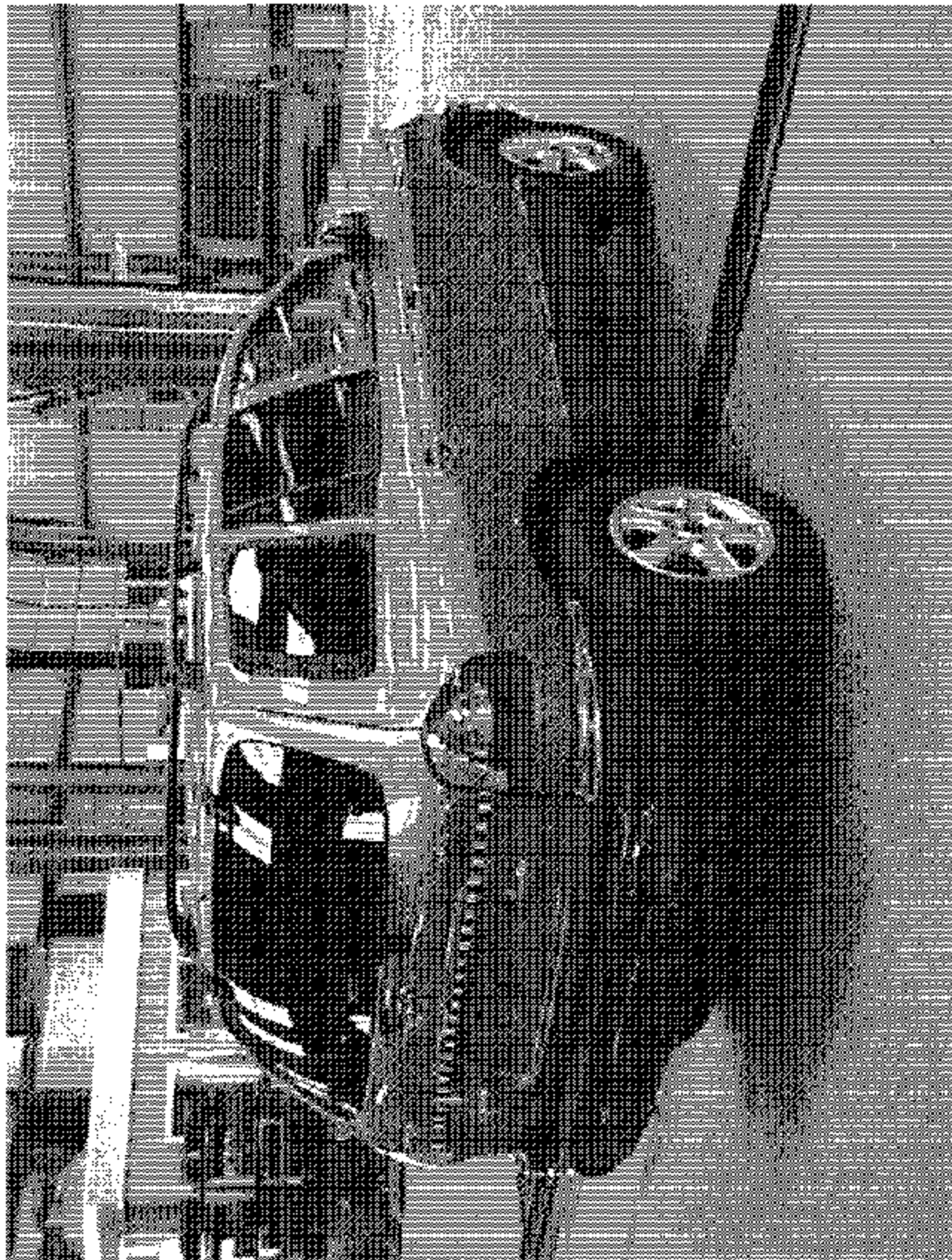
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NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.23
REAR VIEW OF VEHICLE POST TEST



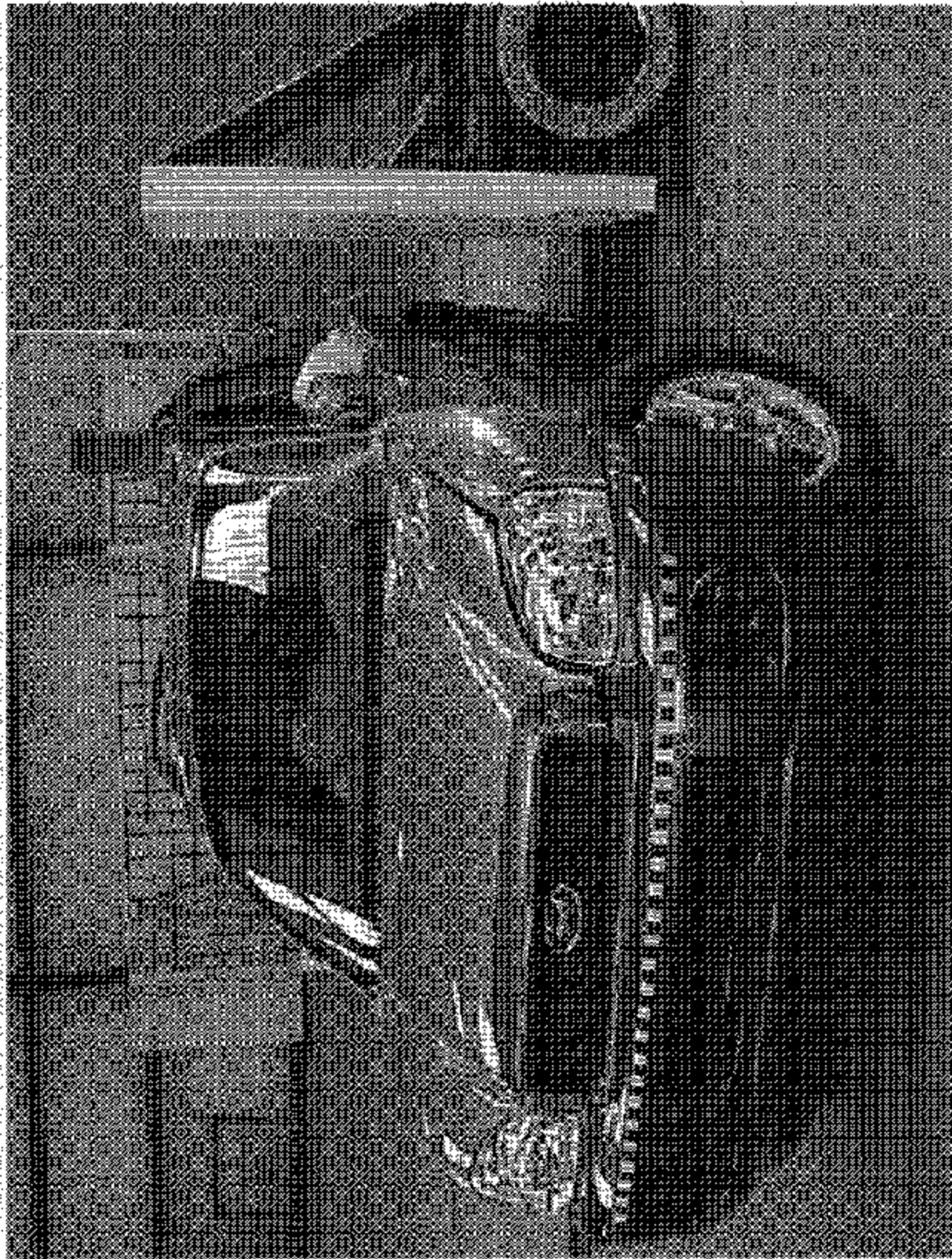
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NHTSA NO. C36508
FMVSS NO. 301L

FIGURE 5.24
3/4 FRONTAL VIEW FROM LEFT SIDE OF
VEHICLE POST TEST



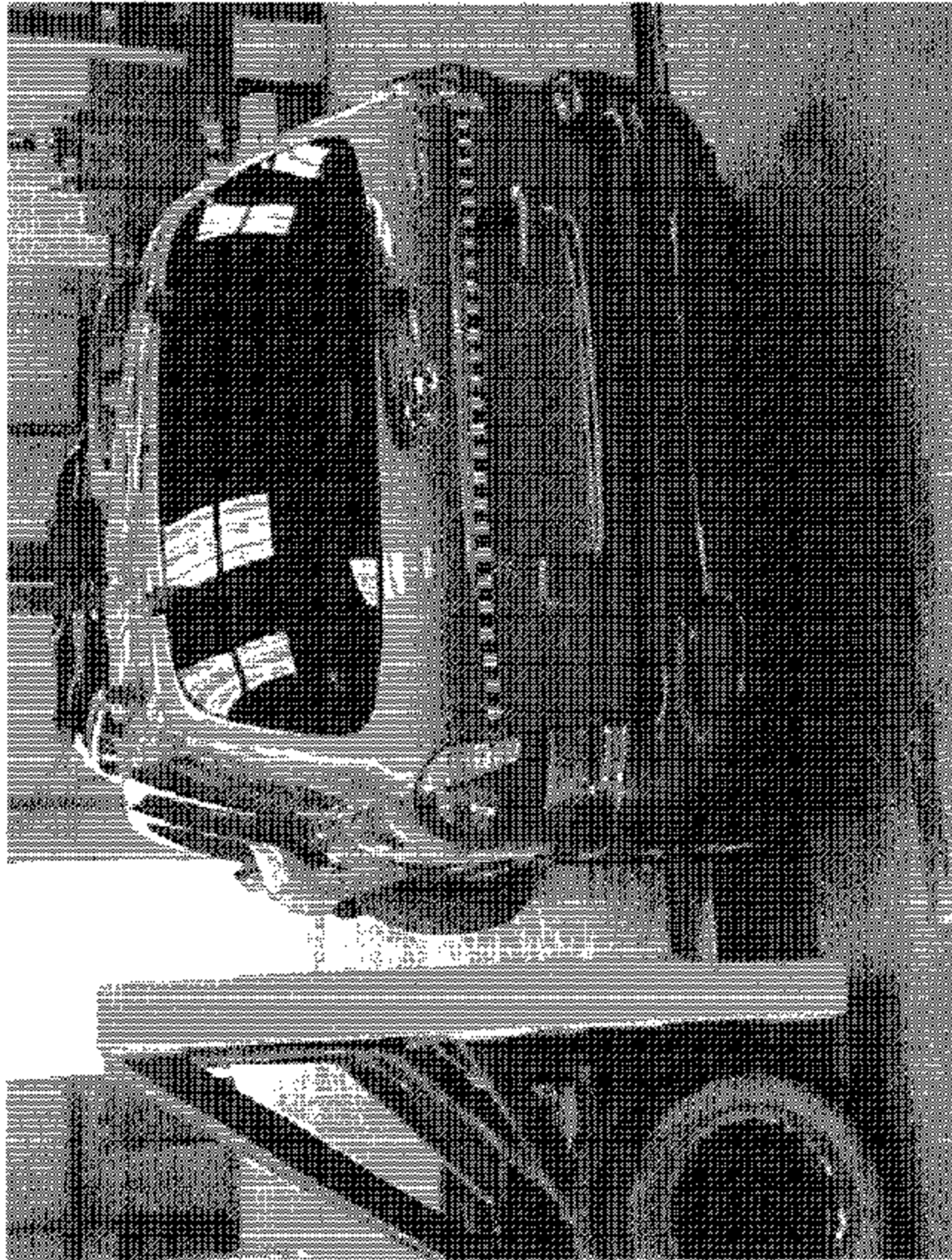
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FMVSS NO. 301L

FIGURE 5.25
¾ REAR VIEW FROM RIGHT SIDE OF
VEHICLE POST TEST



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FIGURE 5.26
LEFT VIEW OF VEHICLE/BARRIER
POST TEST



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FIGURE 5.27
RIGHT VIEW OF VEHICLE/BARRIER
POST TEST



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FIGURE 5.28
UNDERBODY VIEW OF FUEL TANK RIGHT
VIEW POST TEST



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FIGURE 5.29
UNDERBODY VIEW OF FUEL TANK LEFT
VIEW POST TEST



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FMVSS NO. 301L

FIGURE 5.30
UNDERBODY VIEW OF FUEL TANK FRONT
VIEW POST TEST



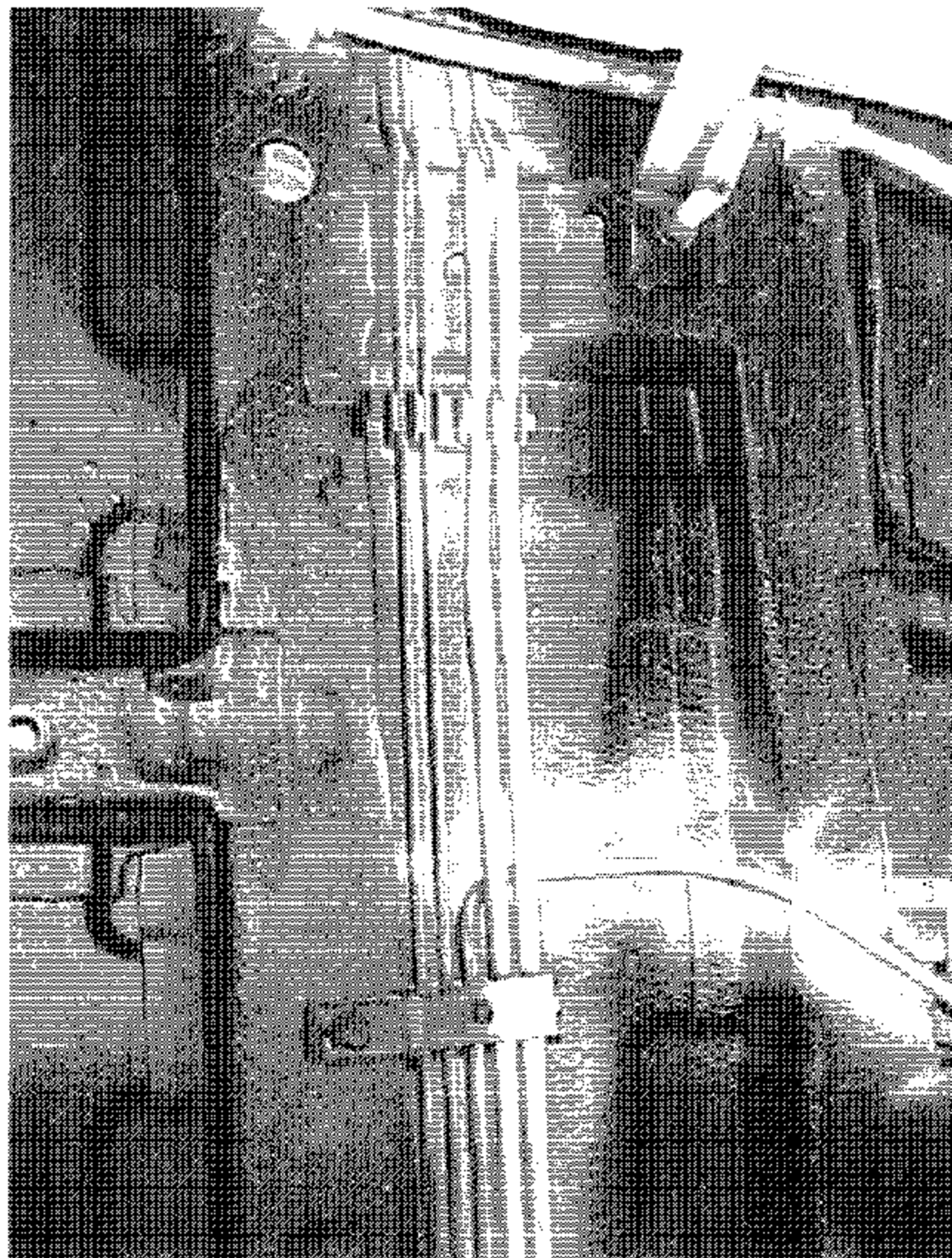
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NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.31
UNDERBODY VIEW OF FUEL TANK REAR
VIEW POST TEST



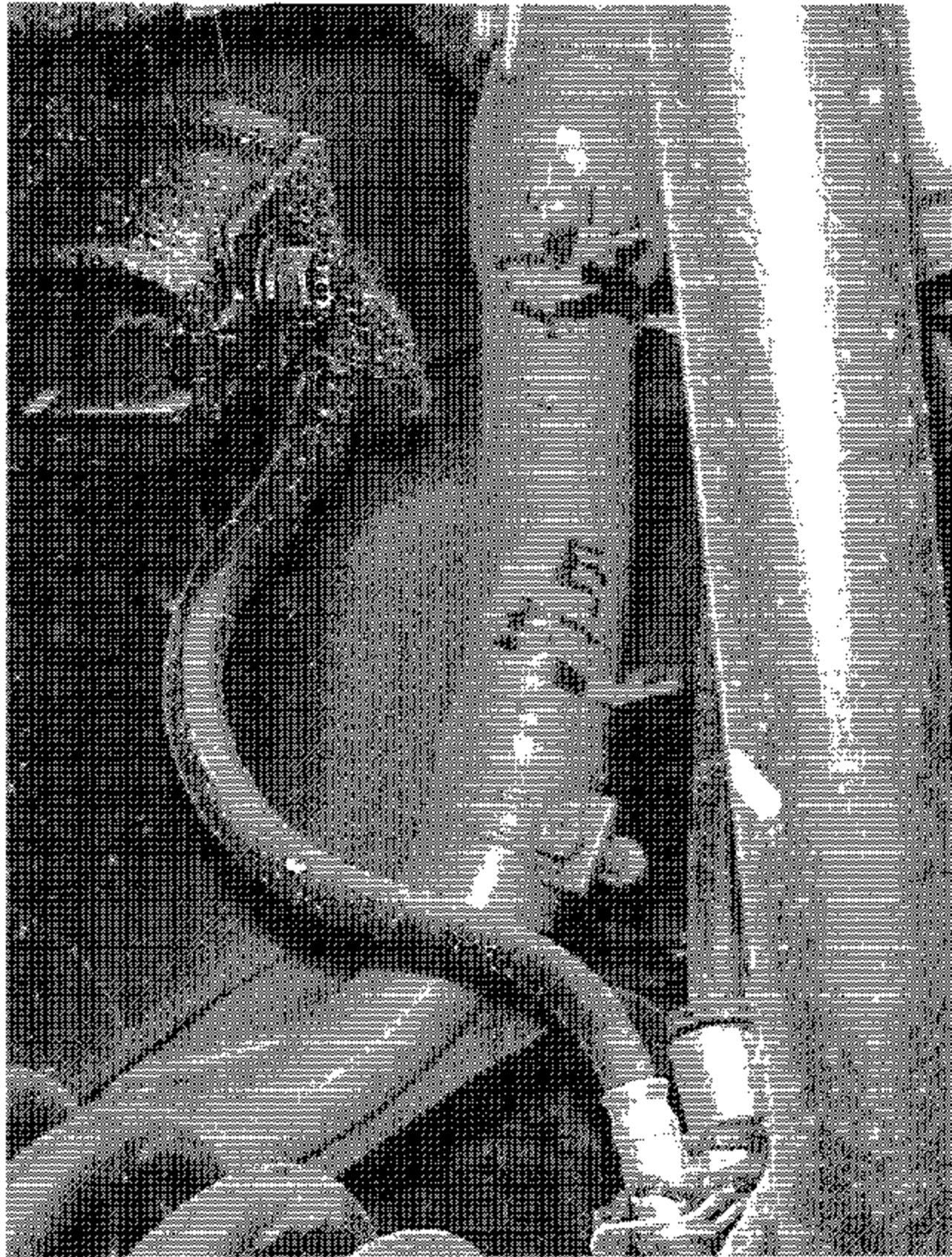
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NHTSA NO. C30508
FMVSS NO. 3011

FIGURE 5.32
UNDERBODY VIEW OF FUEL LINES AT
FRONT POST TEST



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NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.33
UNDERBODY VIEW OF FUEL LINES AT
TANK POST TEST



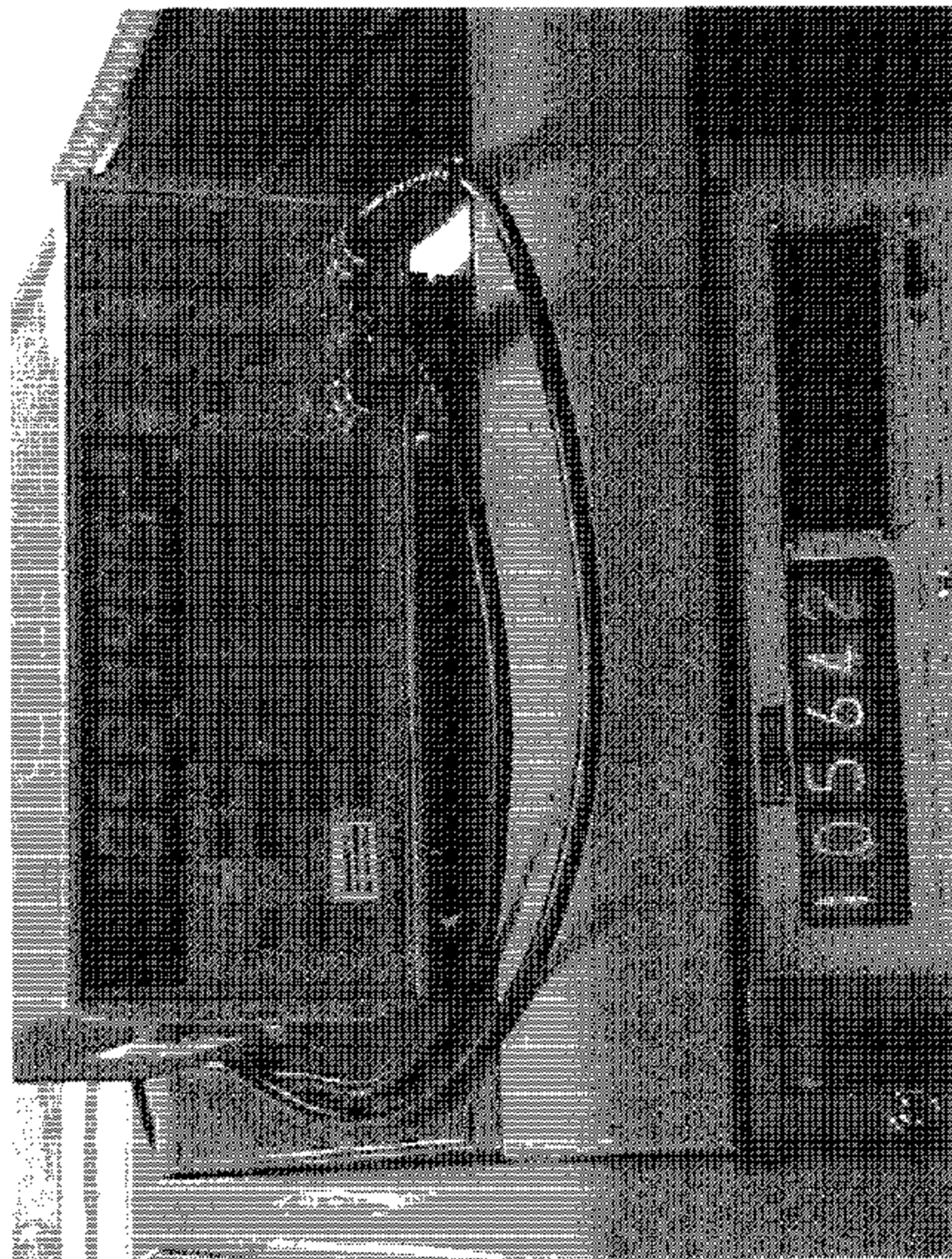
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NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.34
UNDERBODY VIEW OF FILL HOSE
POST TEST



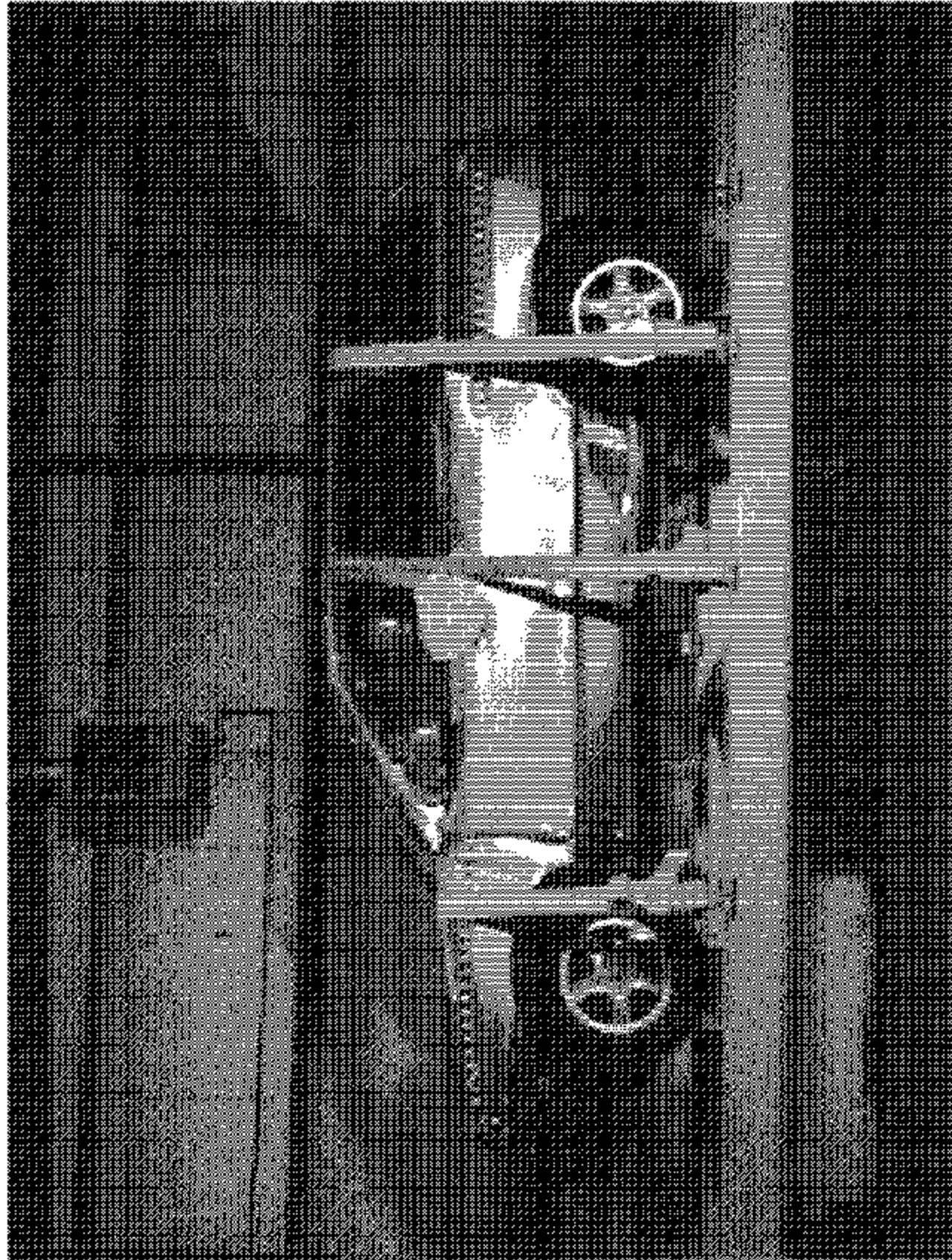
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NJ/TA NO. C36508
FMVSS NO. 301L

FIGURE 5.35
UNDERBODY VIEW OF FUEL VAPOR LINES
POST TEST



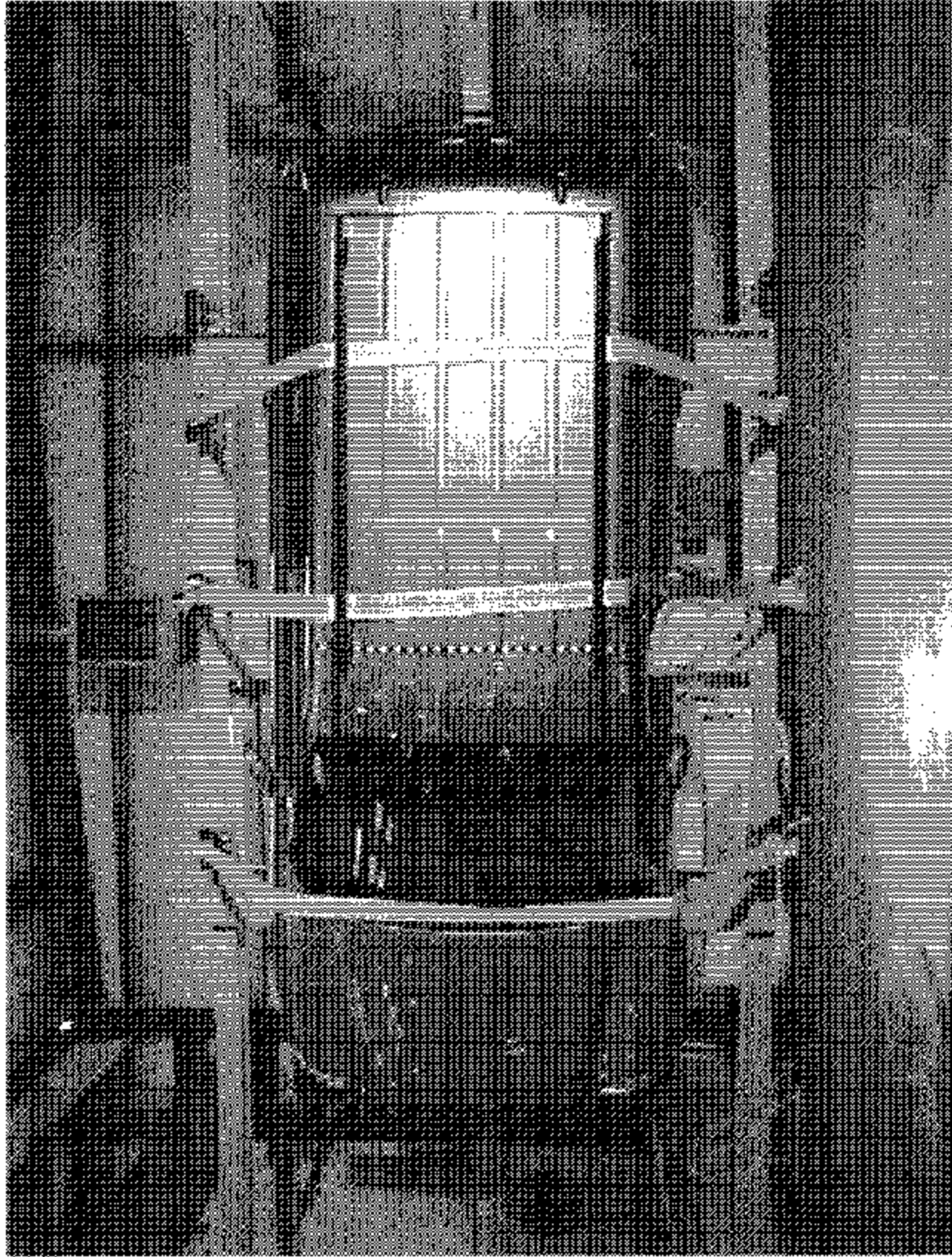
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NHTSA NO. C30508
FMVSS NO. 301L

FIGURE 5.36
SPEED COUNTERS POST TEST



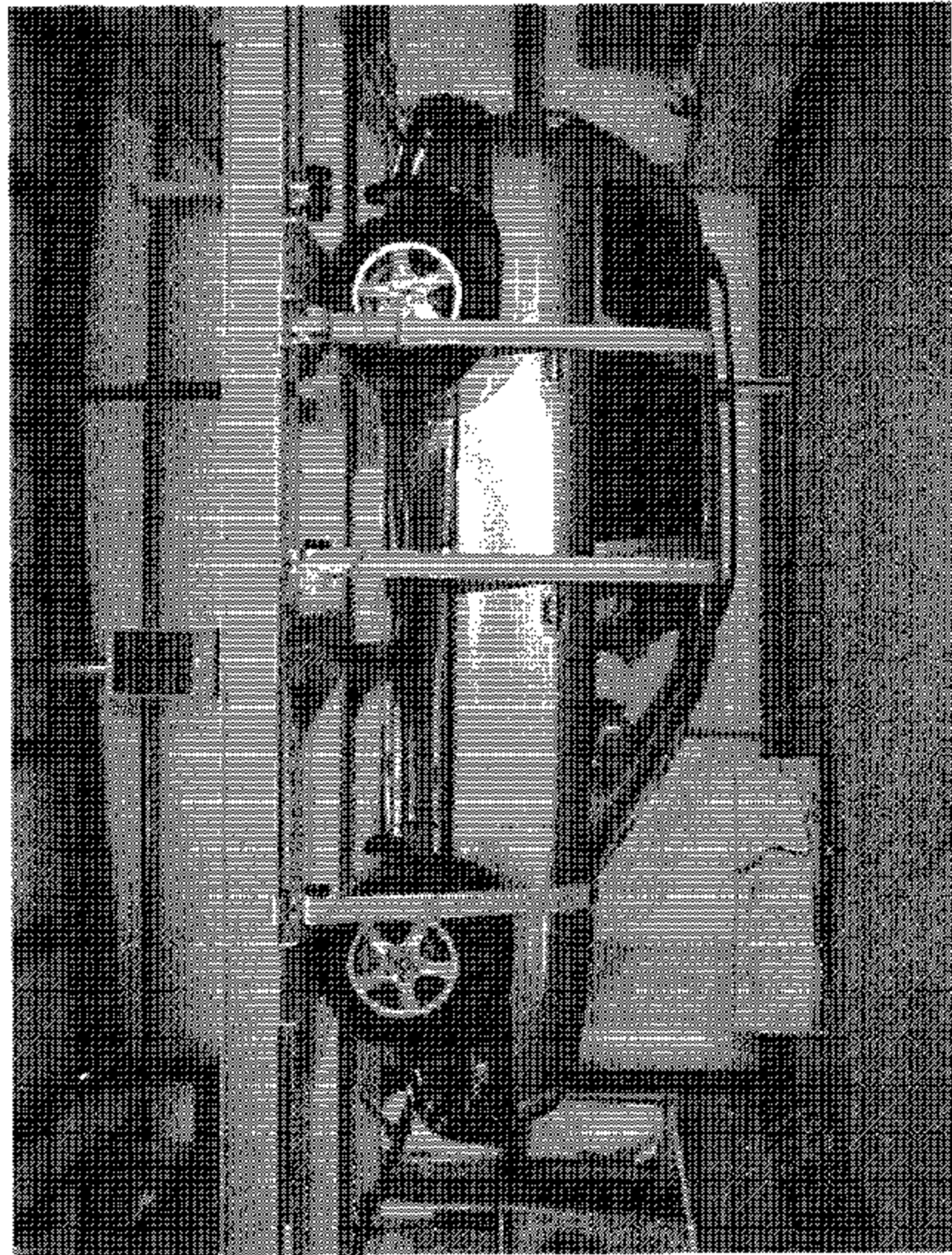
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NHISA NO. C30508
FMVSS NO. 301L

FIGURE 5.37
VEHICLE IN ROLLOVER FIXTURE AT 0°



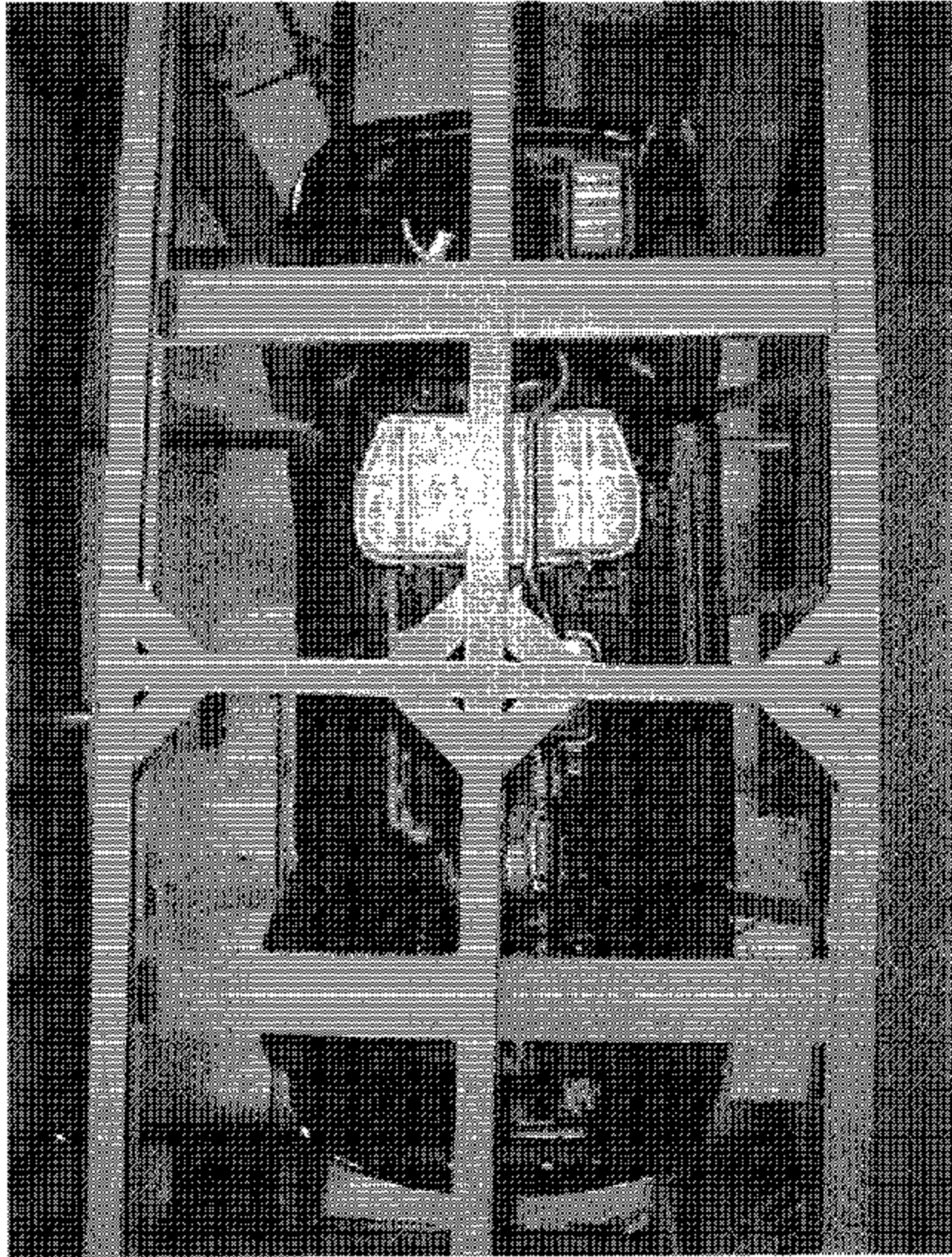
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FIGURE 5.38
VEHICLE IN ROLLOVER FIXTURE AT 90°



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FMVSS NO. 301L

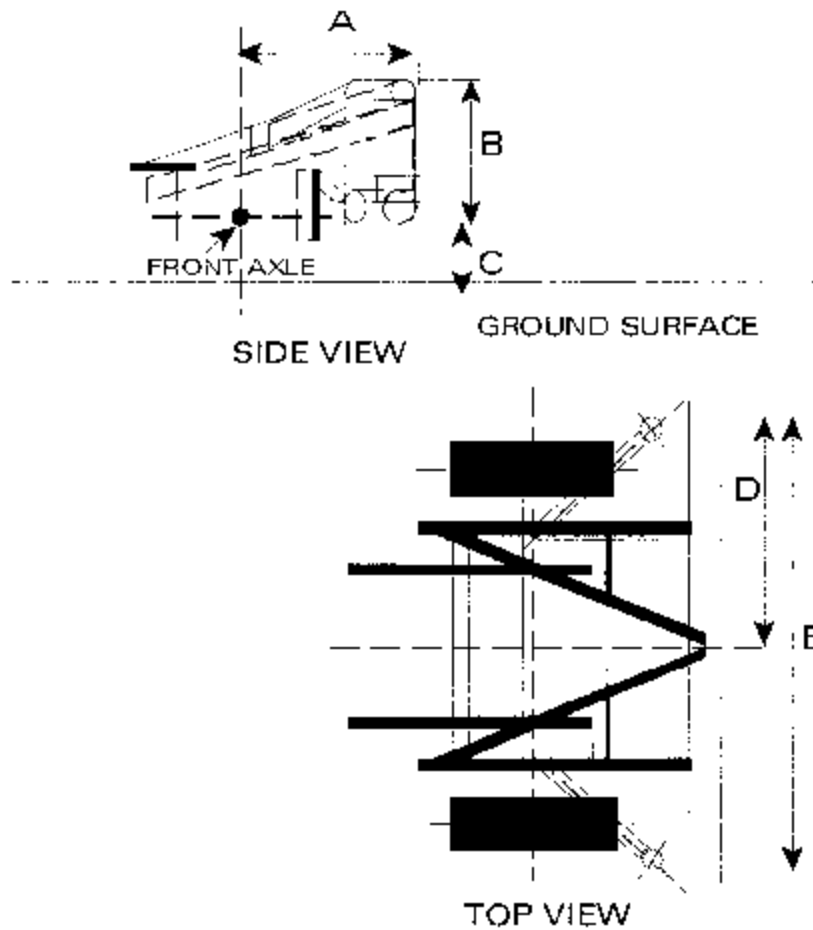
FIGURE 5.39
VEHICLE IN ROLLOVER FIXTURE AT 180°



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FIGURE 5.40
VEHICLE IN ROLLOVER FIXTURE AT 270°

SECTION 6
BARRIER INFORMATION



DIMENSIONS SHOWN IN TABLE ON NEXT PAGE

NOTES:

- 1.Face Plate 0.50 in. (19mm) thick cold rolled steel
- 2.All Inner Reinforcements 4.0 x 2.0 x 0.19 in. (102 x 51 x 5mm) Steel Tubing
- 3.Impact Surface above shown without .75 x 48 x 96 in. Plywood Face attached

LETTER	INCHES	MILLIMETERS
A	20.5*	521*
B	60.0	1524
C	5.0	127
D	39.0	991
E	78.0	198

TEST SET-UP OF COMMON CARRIAGE WITH 60" x 78" FLAT FACE IMPACT SURFACE INSTALLED:

LEFT FRONT WEIGHT 1081
 RIGHT FRONT WEIGHT 1079
 LEFT REAR WEIGHT 882
 RIGHT REAR WEIGHT 873

TOTAL WEIGHT 3915

* EXCLUDING 3/4" PLYWOOD FACE

DIMENSIONS FOR GTL 60" x 78" FLAT FACE IMPACT SURFACE